DOCUMENT RESUME

ED 112 001 CE 004 748

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INSTITUTION	Wisconsin Univ. - Stout, Menomonie. Center for Vocational, Technical and Adult Education.
SPONS AGENCY	Wisconsin State Dept. of Public Instruction, Madison.
NOTE	228p.; For related documents, see ED 097 538-552, CE 004 735-736, and CE 004 743-747; For the Wisconsin Guide to Local Curriculum Improvement in Industrial Education, see ED 092 799
EDRS PRICE	MF-$0.76 HC-$12.05 Plus Postage
DESCRIPTORS	Business Education; Class Activities; Energy; *Industrial Education; *Instructional Materials; Junior High Schools; *Learning Activities; Lumber Industry; Metal Industry; Secondary Education

ABSTRACT

The document contains eight student directed and two teacher directed activity packages, and a proposed curriculum guide; all pertain to field objectives 1, 2, or 3 of the Wisconsin Guide to Local Curriculum Improvement in Industrial Education, K-12. Geared to the junior high level, the student packages are entitled: Repair of a Lamp Cord and Socket (outlining the procedure and equipment necessary to do the job); Power and Energy (defining power and how it is used to produce goods and services); Early Lumbering (exploring the development of the industry); What Is Property? (examining its influence on industry); How Does Management Affect Industry and Society? (discussing how industry functions in society); Human Resources (defining the manpower element of industry); and Mass Production Activities (diagraming and listing materials and procedures for building five puzzles). The teacher packages are: The Development of Communications, which outlines a class approach for the teacher emphasizing historical growth and which is supplemented by an audiovisual presentation, and Let's Make a Kite, which suggests problem solving, mass production, and individualized activities for the classroom teacher. A proposed curriculum, Metals Industries, outlines scope and sequence for each of four proposed units, including laboratory work, field trips, and a class enterprise. (IH)

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MASS PRODUCTION ACTIVITIES

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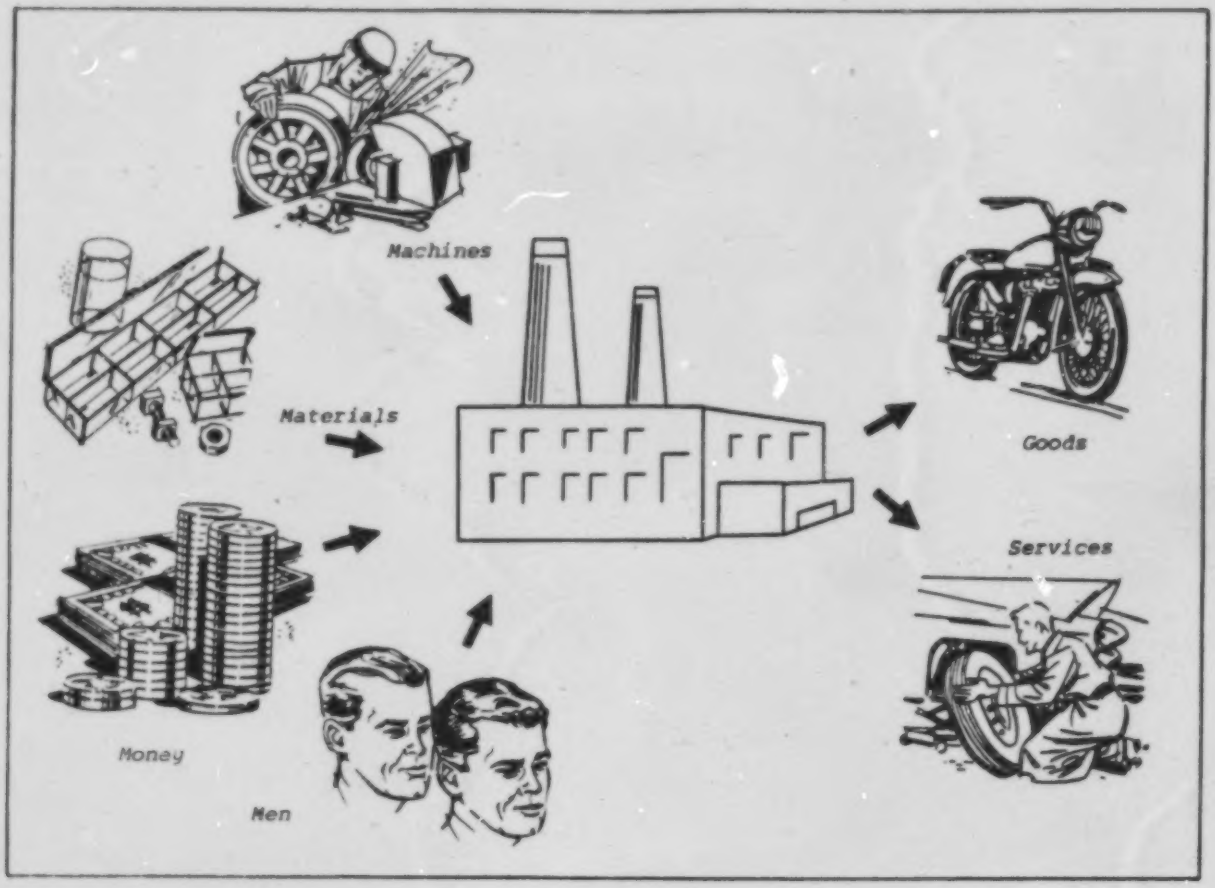

Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

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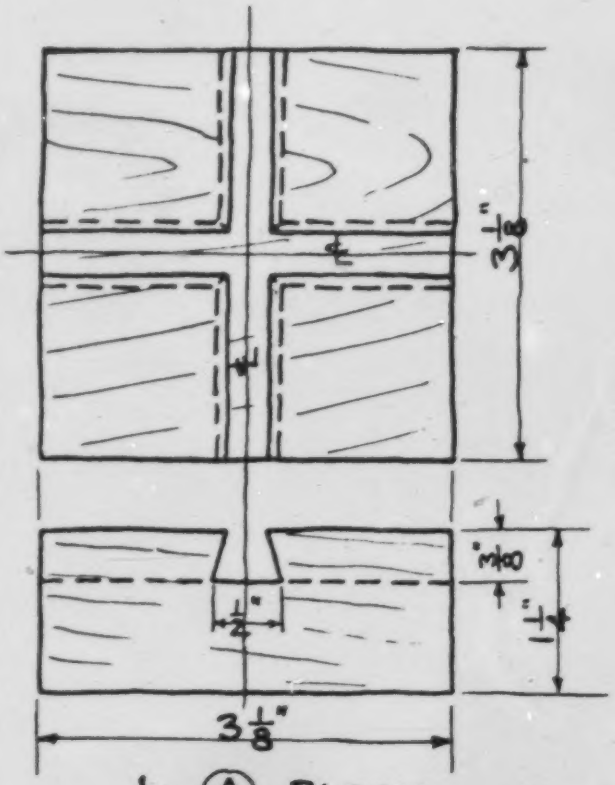
DO-NOTHING MACHINE



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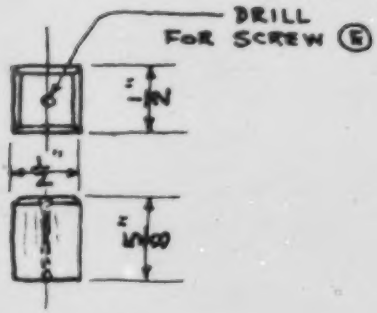
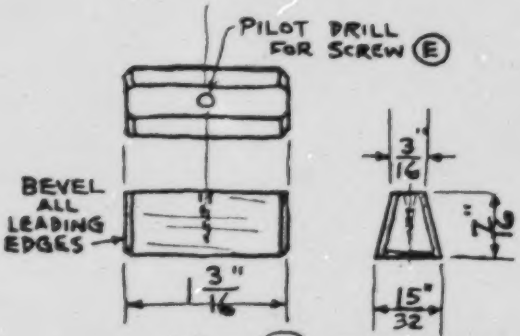
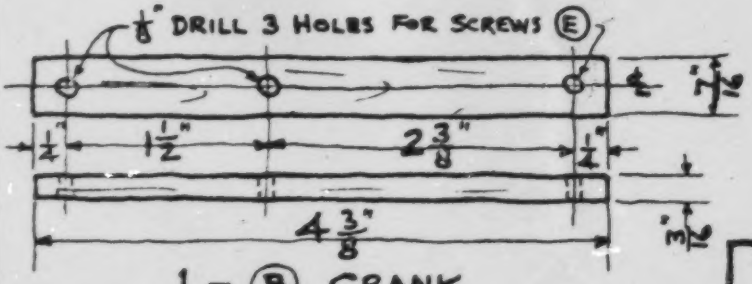


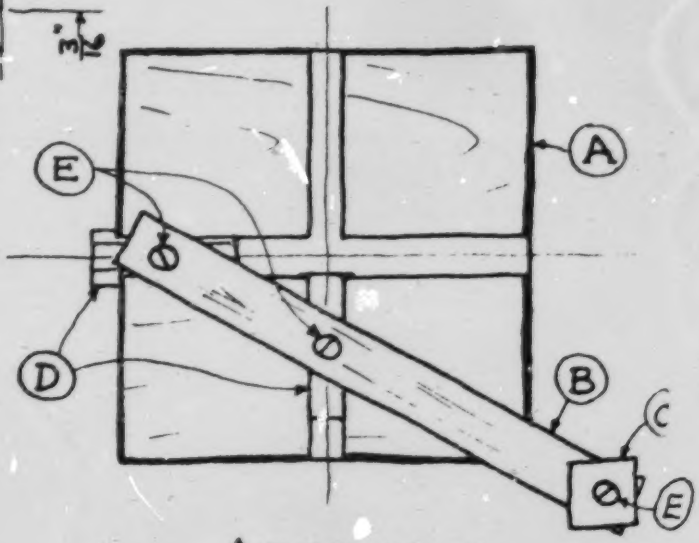
1 - (C) HANDLE



2 - (D) PISTONS



1 - (B) CRANK



ASSEMBLY

(OR SMOKE GRINDER)

This device does only what its name implies, but it does a good job of that! It is a block of wood with two dovetail grooves milled into it at right angles to each other. In each groove is a little wooden piston, and the two pistons are connected by a crank arm. When the crank handle is turned, the pistons move back and forth across the block but never strike each other. The handle can be turned around and around, accomplishing nothing except creating laughter.

Surprisingly, the handle does not follow a circular path as it is turned, but rather it describes the shape of an ellipse, or oval. So actually the do-nothing machine does do something! In the science of machine kinematics, it is known as an elliptical trammel and is used in drawing ellipses. A similar mechanism called the elliptical chuck has been used in machining elliptical sections.

Sometimes called a smoke grinder, this toy can be confused with another smoke grinder which is a toy version of a primitive drill.

MATERIALS

1 (A) BLOCK, hardwood 3⅛" x 3⅛" x 1¼"
1 (B) CRANK, hardwood 4⅜" x 7/16" x 3/16"
1 (C) HANDLE, hardwood ⅝" x ½" x ½"
2 (D) PISTONS, hardwood 1 3/16" x 15/32" x 7/16"
3 (E) WOOD SCREWS, roundheaded ½" long
(F) GLUE, white

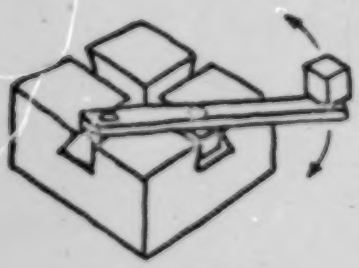
Cut out the various parts, using contrasting wood colors, if possible, for better appearance.

Cut the two intersecting dovetail grooves into the block, using a router with a ½"-wide dovetail cutter going ⅜" deep. To prevent the block from chipping when the cutter enters or leaves the cut, it is advisable to clamp the block between two scrap blocks while cutting.

Drill the three holes in the crank and the pilot holes in the handle and pistons for screws. Bevel all leading edges of the pistons to prevent them from binding in the grooves. When the final assembly fitting is done, the screws may be glued in so that they will not loosen from use. A little paraffin wax applied to the grooves will smooth the operation.

At first glance, one would think that the cutting of the dovetail grooves is the most difficult part of making this device. Actually, the shaping and proper fitting of the pistons are much more difficult.

Operating this toy requires no talent whatsoever. Just crank it!



IN USE

FURNITURE PUZZLE

Hardly difficult enough to be called a puzzle, this block of wood has been given nine cuts in an ingenious manner so that, when taken apart, ten pieces of furniture emerge. Included are various sizes of tables and chairs. In a very short time all may be band-sawed out of a single wooden block. Due to the clever interlocking design, there is no scrap except a little sawdust. The individual pieces may actually be used as doll furniture.

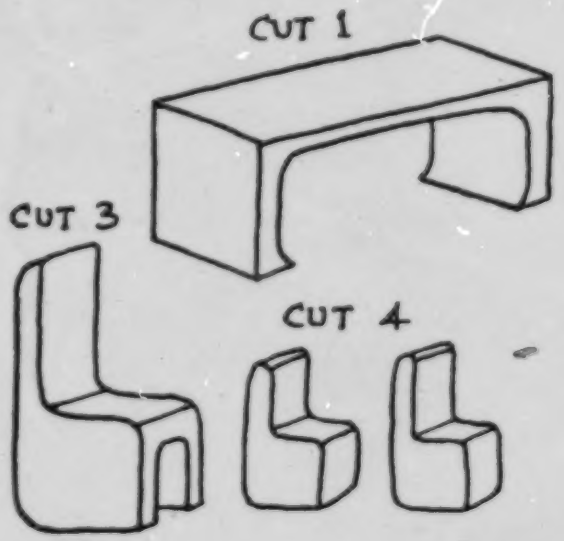
MATERIAL

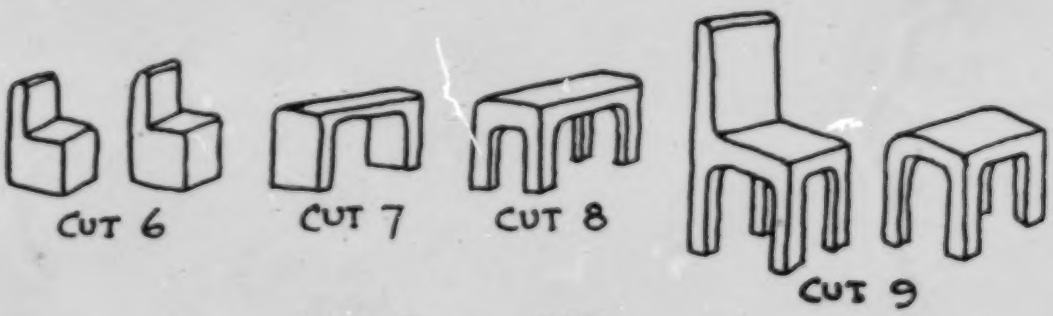
1 (A) BLOCK, hardwood 3½" x 3½" x 8" long

Start with the hardwood block, 3½" x 3½" x 8". The square cross section (3½" x 3½") should have rounded corners, about 3/16" radius. Using a band saw, perform each of the nine cuts in the sequence shown in the diagram. Except where otherwise shown, the thickness of all parts cut is ⅜", and all radii are ⅜".

Cut #1 produces a large-size table.
Cut #2 separates two groups for further cutting.
Cut #3 produces a large-size chair.
Cut #4 produces two medium-size chairs.
Cut #5 separates two groups for further cutting.
Cut #6 produces two small-size chairs.
Cut #7 produces a small-size table.
Cut #8 produces a small-size table.
Cut #9 produces a large-size chair and a medium-size table.

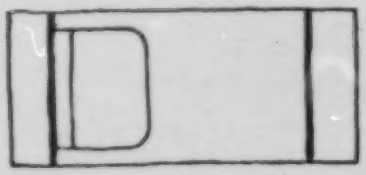
Sand lightly any cuts if necessary. Reassemble the block, and keep it together by wrapping two broad rubber bands around the block.

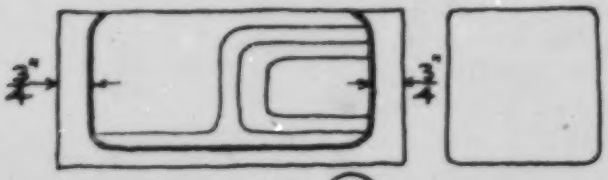




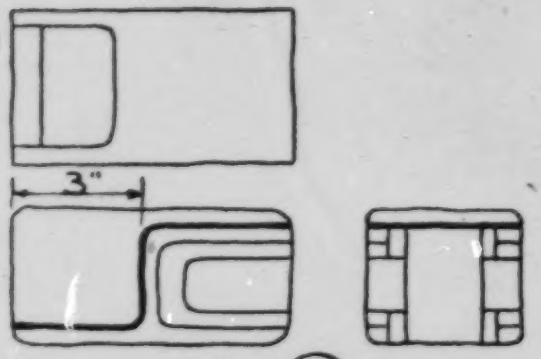
START WITH A HARDWOOD BLOCK (A) $3\frac{1}{2}$" × $3\frac{1}{2}$" × 8"

- ALL CUTS MAKE PARTS $\frac{3}{8}$" THICK UNLESS OTHERWISE NOTED.
- RADII ARE $\frac{3}{8}$".

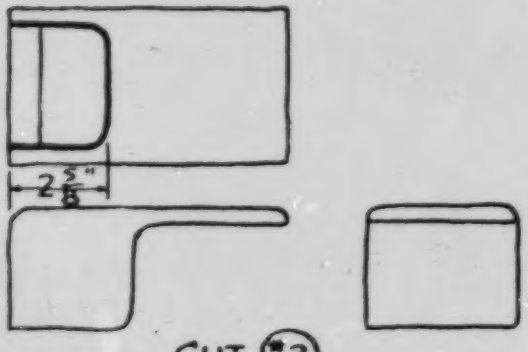




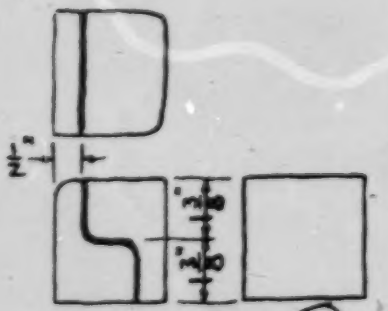
CUT #1



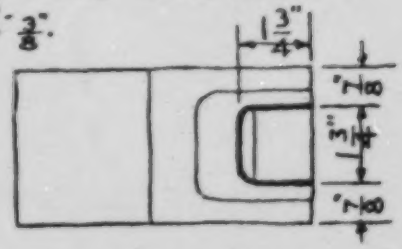
CUT #2

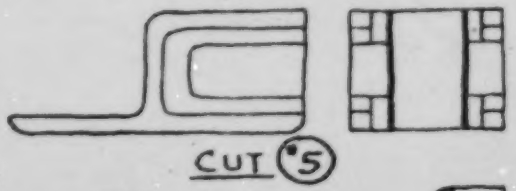


CUT #3



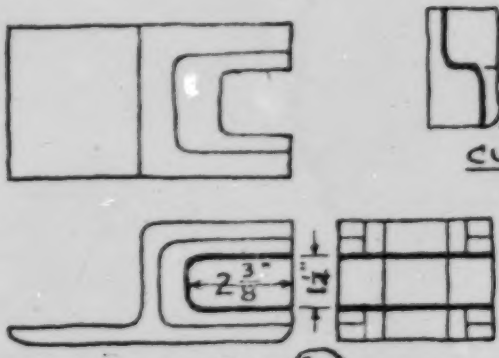
CUT #4



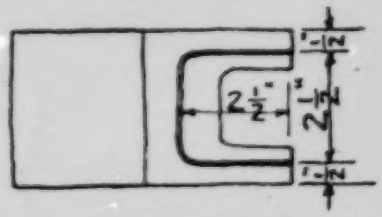


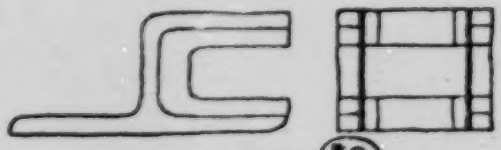
CUT #5

CUT #6

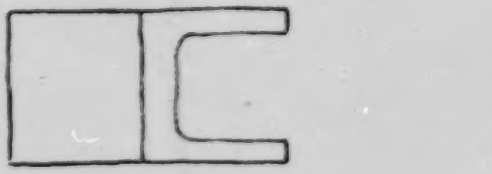


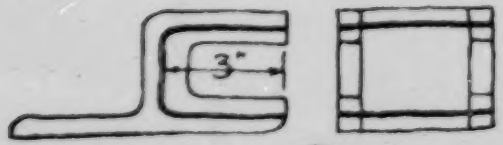
CUT #7





CUT #8





CUT #9

PYRAMID PUZZLE

There are three upright posts on a wooden base. On the left-hand post are seven wooden plates of various sizes with center holes. They are stacked in graduated pyramid order, so each plate is smaller than the one just below it. Using the three posts for intermediate moves, moving one plate at a time and never placing a larger plate on a smaller plate, try to move the entire pyramid stack from the left post to the right post.

The puzzle is not difficult, once the routine of the moves is discovered. It will take 127 moves to transfer the seven plates.

Now for a classical example of the power of arithmetic progressions: How many moves would it take if, instead of seven plates, there were thirty-six plates?

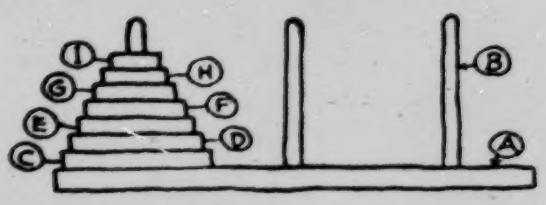
Answer: 68,719,476,735! Yes, more than 68 billion moves, which, if done at the rate of one move per second, would take 2,180 years! That is why this puzzle doesn't have thirty-six plates!

MATERIALS

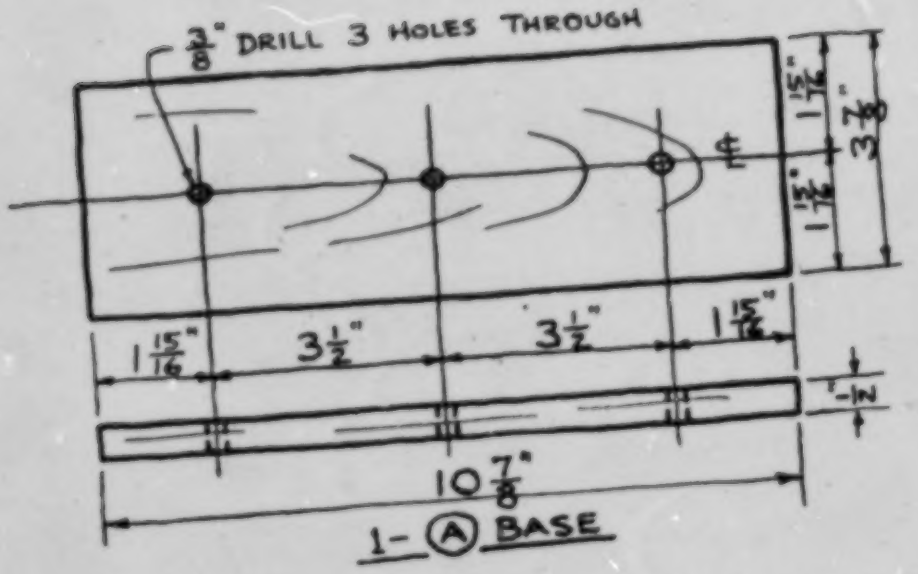
1 (A) BASE, hardwood 10⅞" x 3⅞" x ½"
3 (B) POSTS, birch dowels ⅜" diam. x 3⅜" long
1 (C) PLATE, maple wood 3½" x 3½" x 5/16"
1 (D) PLATE, cherry wood 3⅛" x 3⅛" x 5/16"
1 (E) PLATE, walnut wood 2¾" x 2¾" x 5/16"
1 (F) PLATE, maple wood 2⅜" x 2⅜" x 5/16"
1 (G) PLATE, cherry wood 2" x 2" x 5/16"
1 (H) PLATE, walnut wood 1⅝" x 1⅝" x 5/16"
1 (I) PLATE, maple wood 1¼" x 1¼" x 5/16"
(J) GLUE, white

Cut all the parts to sizes shown. Lay out and drill all holes in the base and in the plates. Round top ends of the posts, and glue the posts into the holes in the base. Sand all parts smooth. Place the seven plates on the left-hand post.

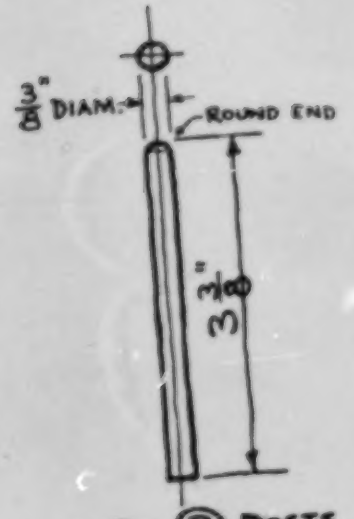
The correct sequence of moves will be as follows: Always move the *smallest plate* on *every other move*, going from left to center to right, then back to left to center to right. On the *alternate moves*, make *whatever move is legal* (never placing a larger plate on a smaller one). The puzzle becomes easy, once you know this routine.



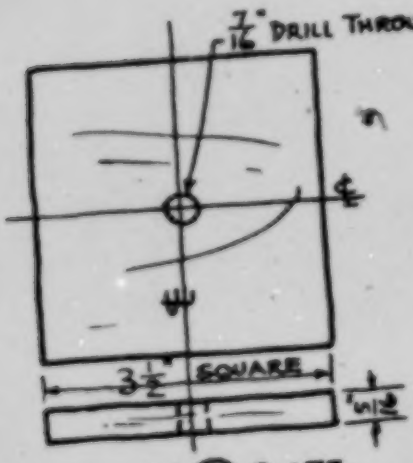
ASSEMBLY



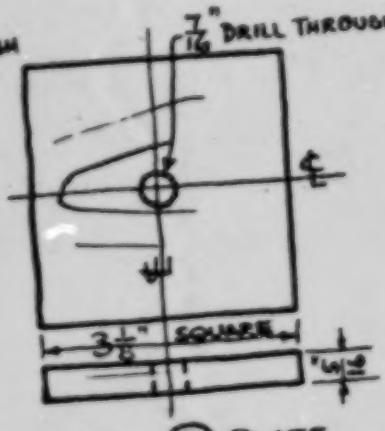
1- (A) BASE



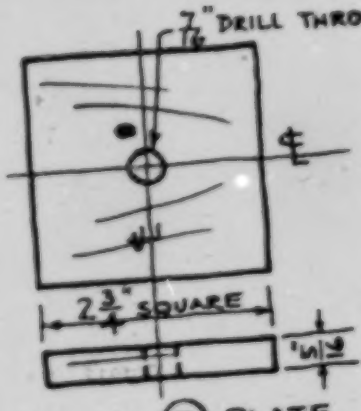
3- (B) POSTS



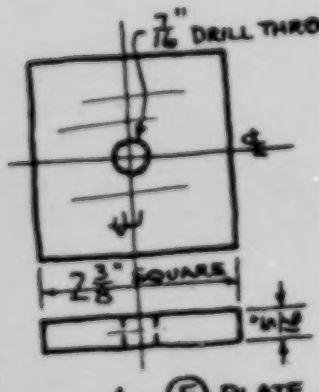
1- (C) PLATE



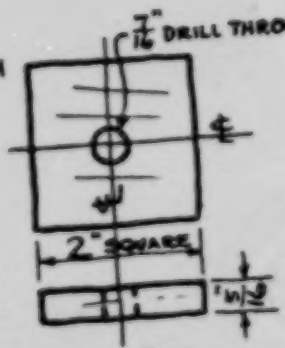
1- (D) PLATE



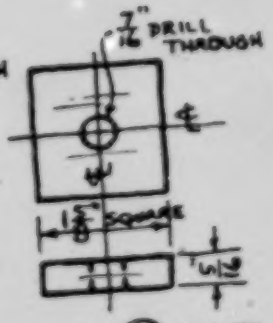
1- (E) PLATE



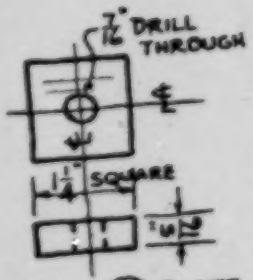
1- (F) PLATE



1- (G) PLATE

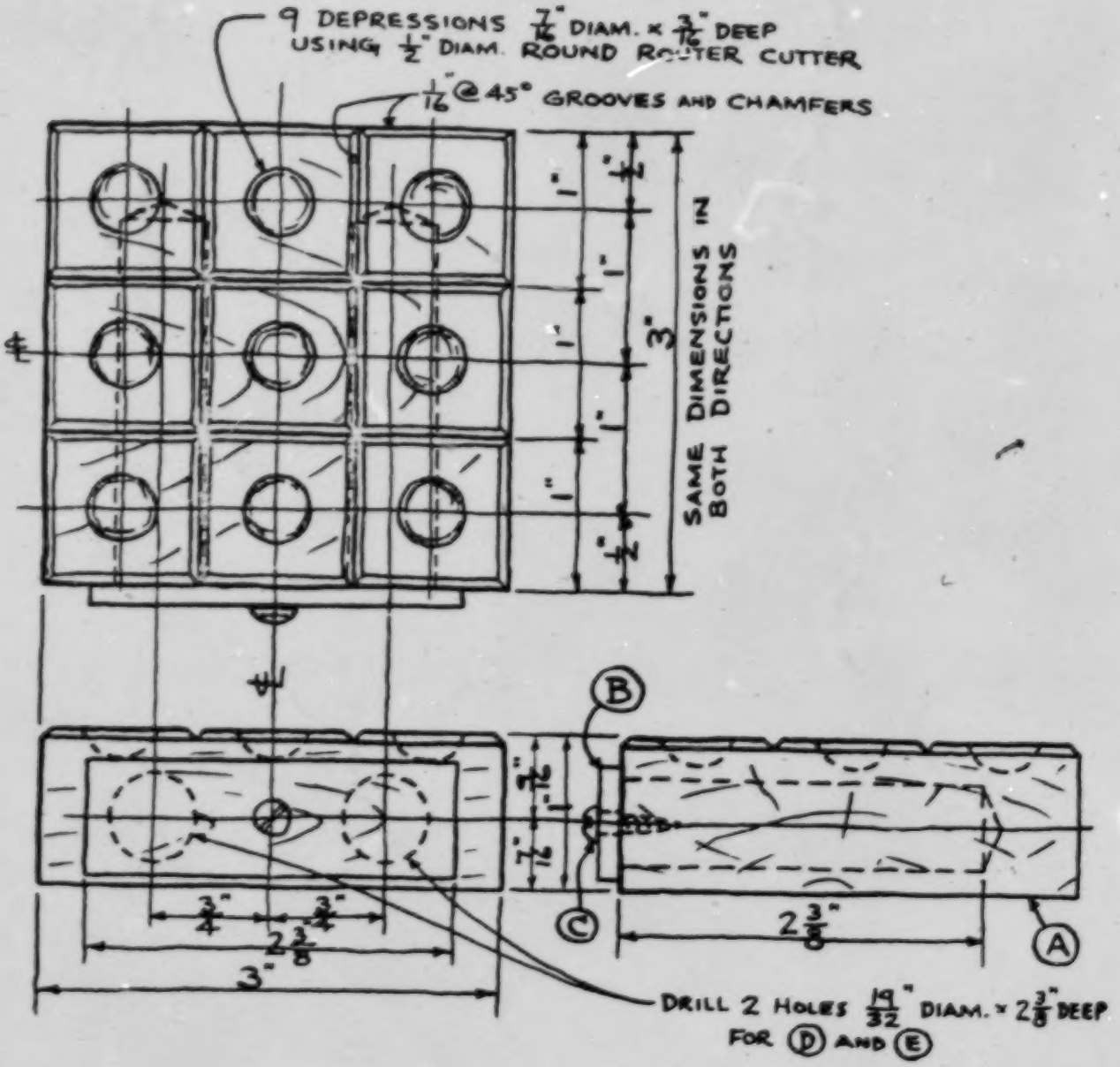


1- (H) PLATE



1- (I) PLATE

NOTE: SCALE VARIES



GAME BOARD ASSEMBLY

TICKTACKTOE

"Three in a row." That is the object of this very old game. It is often played with pencil and paper, drawing a grid of two vertical and two horizontal lines, giving nine spaces. X's and O's are filled in alternately by the two respective players in an effort to get the three in a row vertically, horizontally, or diagonally while blocking similar efforts of the opponent. Skilled players know all the moves and usually can play to a draw.

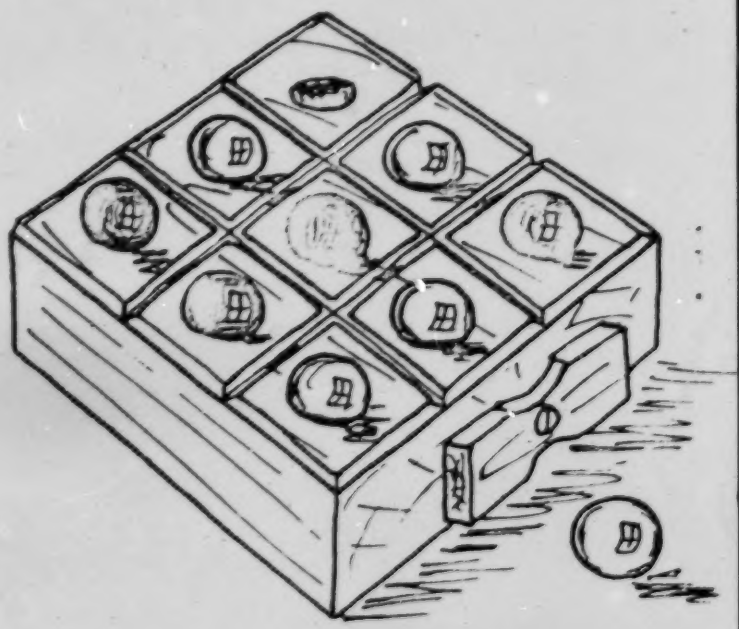
Sometimes a wooden game board is made up to provide a permanent playing grid. The moves may be made with colored pegs inserted in holes or with colored marbles in shallow depressions.

MATERIALS

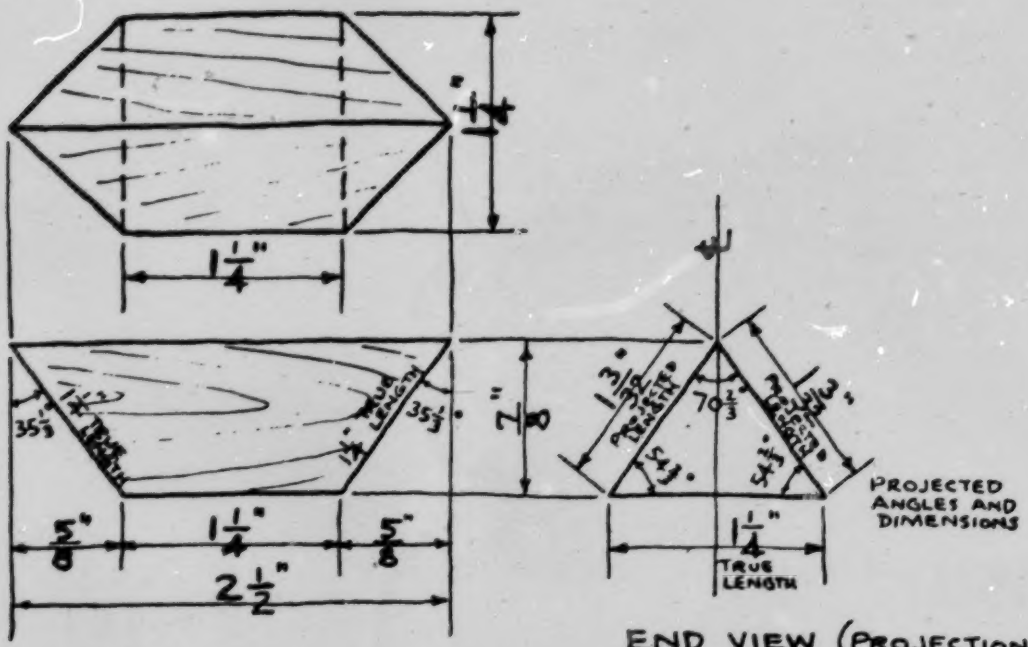
1 (A) BOARD, hardwood 3" x 3" x 1" thick
1 (B) TAB, hardwood 2 3/8" x 3/4" x 1/8"
1 (C) SCREW, plated roundheaded wood screw, 1/2" long
4 (D) BLACK MARBLES, glass 1/2" diameter
4 (E) WHITE MARBLES, glass 1/2" diameter

Cut the board to size. Drill the two deep holes for storage of the marbles. Lay out the lines, chamfers and depressions on the top surface of the board, and cut them in, using a router. Cut the tab to size, drill the center hole and fasten the tab to the board with the screw. Load the marbles into the storage holes, black in one side, white in the other.

The game is played by two persons in the well-known "ticktacktoe, three in a row" manner.



TWO-PIECE PUZZLE



END VIEW (PROJECTION)

MAKE UP A TRIANGULAR BAR OF THIS CROSS-SECTION AT LEAST 6" LONG, THEN CUT THE 2 PIECES TO LENGTH.

This puzzle is so simple that it becomes frustrating! Who *can't* fit together *two* simple identical geometric shapes to form a pyramid? Eventually everyone gets the answer, but it takes longer than one would think. The reason seems to be that a person usually tries to fit the two identical pieces together in symmetrical fashion, but the answer is nonsymmetrical. Put the two squares together, and rotate one piece. They make a special kind of pyramid known as a tetrahedron, with all four sides being equilateral triangles.

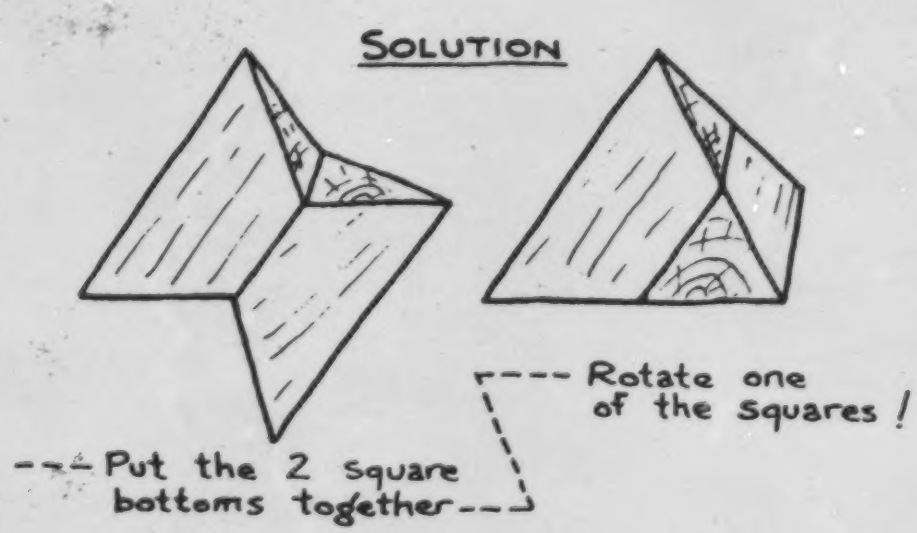
MATERIAL

1 (A) WOOD 1⅛" x 1½" x 8"

Careful work is required to make this puzzle, as all angles and lengths must be accurate.

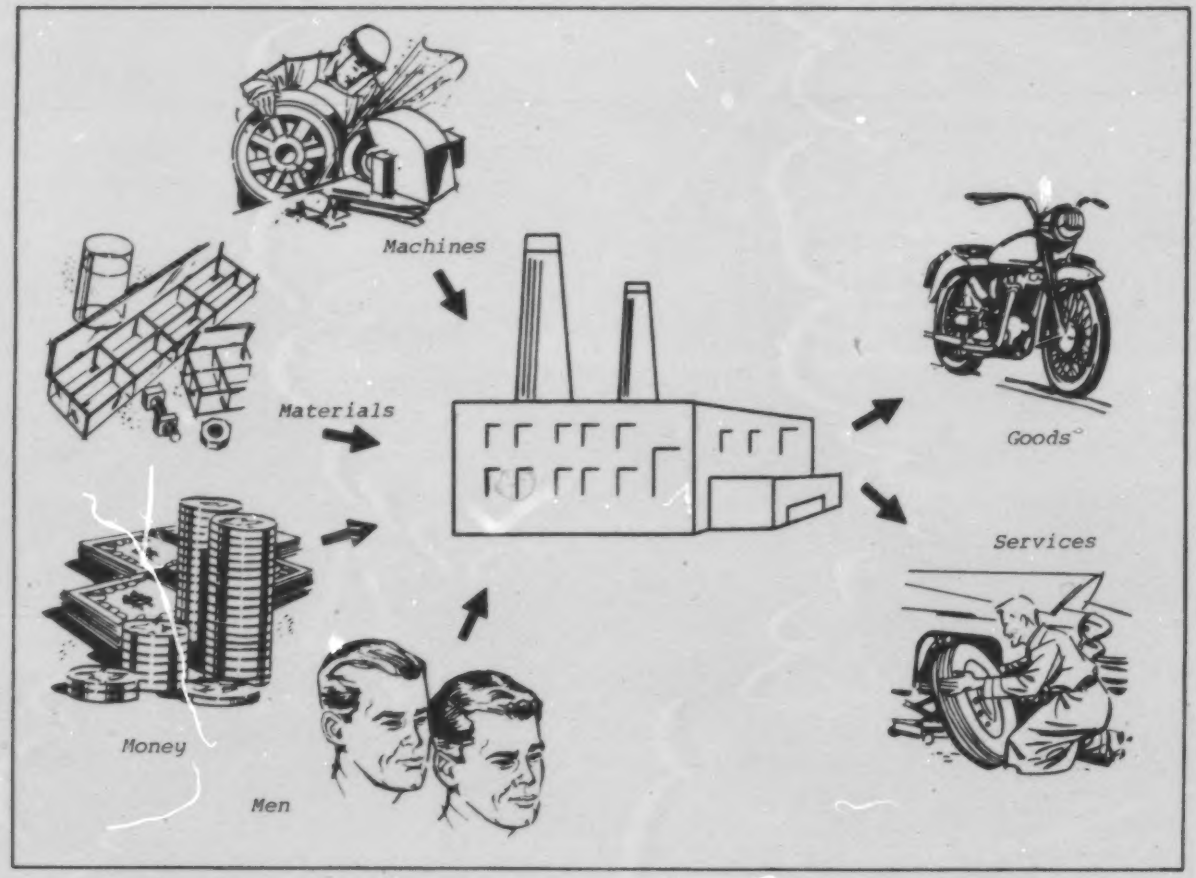
Prepare the straight triangular wooden bar from which the two pieces are made, using a bench saw or table saw. Note that the cross section is *not* a 60° equilateral triangle but rather is an isosceles triangle with a 70⅔° apex (top) angle and two 54⅔° base angles.

From this triangular bar cut the two pieces, with 35⅓° angular cuts at both ends, making sure that the 70⅔° apex angle is on top while cutting. Smooth all cuts by sanding. Put the two pieces together to test the accuracy. If the cutting was done correctly, each piece has a perfectly square base, and all surfaces now *are* 60° equilateral triangles.



HUMAN RESOURCES

JUL 25 1975



Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Learning Activity Package

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Human Resources

Middle-Junior High School

Pertaining to Field Objective Number One

"To provide students the opportunity to work with the human resources element of industry to gain an understanding of how it functions in producing goods and services."

Produced by

The Industrial Education Instructional
Materials Development Project
University of Wisconsin-Stout
Menomonie, Wisconsin

Project Director:

Lawrence S. Wright, Ed.D.

Assistant Director:

M. James Bensen, Ed.D.

Project Coordinator:

John M. Ritz, M.S.

Contributor to this Package:

Jim Walker

Supported by:

The Wisconsin Department of Public Instruction;
The Graduate College and the Center for Vocational,
Technical and Adult Education, both of the
University of Wisconsin-Stout

RATIONALE:

When someone mentions 'machine power' or 'materials resources', you usually have a good idea of what they mean. But when someone says 'human resources' or 'manpower', these terms may not be clear in your mind.

This package is designed to explore the human resources or manpower element of industry. It will define manpower by showing its sources, different levels, and characteristics.

You will, most likely, be employed as a human resource in the future. As you go through this package, try and picture yourself and imagine how you will fit into the scheme of things in the future.

Please turn to the next page and read the objectives carefully!!

OBJECTIVES:

Terminal Objective:

To provide you with the opportunity to work with the element of human resources (manpower) in industry to gain an understanding of how it functions in providing goods and services.

Enabling Objectives:

1. You will, in your own words, define human resources.
2. You will name at least three sources of human resources.
3. You will list at least three kinds of human resource skills and describe how they differ from each other.
4. You will list three characteristics that are considered common to all kinds of human resources and describe how the characteristics differ from kind to kind.

Options: Read the self-test on the following pages and then check the following selections that apply to you.

___ If you feel you can meet the above objectives:

___ A. See the instructor for a teacher evaluation.

___ B. Take the self-test as a self-evaluating device, then see your instructor.

___ If you feel you cannot meet the above objectives:

___ A. Take the self-test to see what objectives your studying should be based upon, then turn to the media section on page 5.

___ B. Skip the self-test and turn to the media section on page 5 to help you achieve the objectives.

Self-Test

1. Define in your own words the term 'human resource'.

2. What are three sources of human resources?

3. What are four kinds of ways of identifying human resources?

4. Describe or show graphically how the four kinds of human resources differ from each other.

5. List the four kinds of ways of identifying human resources and give an example of a job that is performed by each.

6. Name at least three characteristics that can be used when considering the kinds of human resources.

7. Give an example of how one of the characteristics of a human resource would change if you got a different job.

MEDIA SECTION

Objective Number 1: In your own words, define human resources.

Optional Media: Check one or more of the following.

___ 1. Read the information in this package on page 9.

___ 2. Look up human resources or manpower in a dictionary or encyclopedia.

___ 3. Read: Understanding America's Industries, (Gerbracht, 1971), pp. 243-247.

___ 4. Try to view at least one of the films listed below:

A Team Effort, 24 min., (NASA or Eng. Brit.)
Jobs and Advancement - On the Move, 13 min., 1969
Jobs and Continuing Education, 12 min., 1969
Jobs and Their Environments, 14 min., 1969
Jobs for Men - Where am I Going, 11 min., 1969
Jobs for Women - Where are You Going, Virginia, 11 min., 1969
Jobs in the Automotive Trades, 10 min., 1970
Jobs in Cosmetology, 10 min., 1970
Jobs in Drafting, 8 min., 1970
Jobs in Health, 10 min., 1970
Jobs Opportunities in Hotels and Motels, 11 min., 1970
Jobs in Small and Major Electrical Appliance Repair, 7 min., 1970
Jobs in the Baking Industry, 7 min., 1970
Jobs in the City - Construction, 9 min., 1971
Jobs in the City - Distribution, 11 min., 1971
Jobs in the City - Manufacturing, 11 min., 1971
Jobs in the City - Mass Media, 11 min., 1972
Jobs in the City - Services, 11 min., 1971
Jobs in the City - Women at Work, 11 min., 1971
Jobs in the Sheet Metal Trades, 10 min., 1970
Jobs in Welding, 7 min., 1970

Optional Activities:

___ 1. Manpower - I-1A

___ 2. Manpower - Terminal-A

___ 3. Manpower - Terminal-B

___ 4. Manpower - Terminal-C

Objective Number 2: Name at least three sources of human resources.

Optional Media: Check one or more of the following.

___ 1. Read the information in this package on pages 9 thru 11.

___ 2. Read The World of Manufacturing:

a. pp. 215-220, "Hiring and Training"
b. pp. 221-225, "Working, Advancing and Retiring"

___ 3. Read The World of Construction:

a. pp. 133-139, "Hiring Construction Personnel"
b. pp. 140-144, "Training and Education for Construction"

___ 4. Read Understanding America's Industries (Gerbracht, 1971), pp. 243-247, "People in Industry".

___ 5. View the film, "Jobs and Continuing Education", (C, 12 min., 1969)

___ 6. View any of the films available listed in this package on page 5.

Optional Activities:

___ 1. Manpower - I-2A

___ 2. Manpower - I-2B

___ 3. Manpower - Terminal-A

___ 4. Manpower - Terminal-B

___ 5. Manpower - Terminal-C

Objective Number 3: List at least three kinds of human resource skills and describe how they differ from each other.

Optional Media: Check one or more of the following.

___ 1. Read the information in this package on pages 11 thru 13.

___ 2. Read The World of Manufacturing, pp. 202-208, "Employment and Occupations in Manufacturing".

___ 3. Read The World of Construction:

a. pp. 140-144, "Training and Education for Construction"
b. pp. 148-151, "Advancing in Construction"

___ 4. Read American Industry,

a. Student Booklet 1, pp. 39-44, "The Environment of Industry"

b. Student Booklet 4, pp. 3-13, "Getting Along in Business"
c. Student Booklet 7, pp. 9-19, "Job Descriptions"

___ 5. Look through the following pages in Exploring the Industries, (Groneman, 1967), pp. 40-41, 97-99, 128-129, 134-135, 150-151, 160-161, 184-186.

___ 6. View the films (your choice):

Jobs and Advancement - On the move, (13 min., 1969)
Jobs and Continuing Education, (12 min., 1969)
Jobs in the City - Construction, (9 min., 1971)
Jobs in the City - Distribution, (11 min., 1971)
Jobs in the City - Manufacturing, (11 min., 1971)
Jobs in the City - Mass Media, (11 min., 1972)
Jobs in the City - Services, (11 min., 1971)
Jobs in the City - Women at Work, (11 min., 1971)

Optional Activities:

___ 1. Manpower - I-3A

___ 2. Manpower - I-3B

___ 3. Manpower - Terminal-A

___ 4. Manpower - Terminal-B

___ 5. Manpower - Terminal-C

Objective Number 4: List three characteristics that are considered common to all kinds of human resources and describe how the characteristics differ from kind to kind.

Optional Media: Check one or more.

___ 1. Read the information in this package on pages 13 and 14.

___ 2. Read The World of Manufacturing:

a. pp. 202-208, "Employment and Occupations in Manufacturing."
b. pp. 209-214, "Manufacturing Personnel Technology."

___ 3. Read The World of Construction:

a. pp. 119-124, "Working as a Contractor."
b. pp. 148-151, "Advancing in Construction."

___ 4. Read American Industry:

a. Student Booklet 4, pp. 39-44, specialization and division of labor.

b. Student Booklet 6, pp. 27-32, "The Life of Man in the Future."

___ 5. Read Understanding Americas Industries (2nd ed.) pp. 243-247, "People in Industry."

___ 6. View any of the films available listed in this package on page 5.

Optional Activities:

___ 1. Manpower - I-4A

___ 2. Manpower - Terminal-A

___ 3. Manpower - Terminal-B

___ 4. Manpower - Terminal-C

INFORMATION SECTION

Human Resources: Definition

Human resources or manpower are people. It is people with individual talents and skills which are *important* to industry in producing goods and services. A gas station, department store, lumber yard, or factory would not be able to produce, sell or service anything if there were not any people to work in them and manage them.

People are needed to run the machines and to coordinate other people to work together smoothly. Human resources are 'people-power' - people that work together to make industry function.

Sources of Human Resources

Industry has many needs. One of its needs is people who can do a particular job and do it well. To fill a job or position industry has different sources for obtaining people. Some of these sources include employment agencies, apprenticeship programs and schools.

An employment agency can be privately or publicly operated. A private agency is ran by an individual or group who usually charge a fee to individuals who wish to use its services. A public employment office is ran by a city or government agency with no fee for its services. Both agencies are usually in constant touch with industry for jobs available. Industry gives them a description of the job; qualifications, education, and anything else that is needed by a person to perform the job. The agency interviews people and matches their qualifications with the jobs they have listed from the industries.

Large areas of industry, such as carpentry, metal working, and plumbing have what are called apprenticeship programs. The 'trade' industries, as they are sometimes called, train their own people. The 'apprentice' (the name given to the person being trained) works and learns the job from other people who know the job well. The people who train the apprentice are called journeymen and have worked on that particular job for many years. Some classroom instruction is also required for an apprenticeship.

Schools provide a large part of the human resources (manpower) that industry uses. There are many levels of schooling, from high school to beyond college levels.

High school is intended to give you a basic general education. It could prepare you for a unskilled/semiskilled kind of employment.

A vocational school trains people for a specific occupation. An example of a specific occupation would be a welder, machinist, dental technician, or accountant (the apprentice usually goes to a vocational school for classroom training for his 'specific' job). Industry has a need for someone to perform a specific job. Vocational schools are set-up to train people for specific jobs. They train people for jobs that are available only in the geographic area of the school. So, vocational schools educate people for a job that is available in the area by asking industry to predict what needs it will have in the future.

A technical school is different from a vocational school (although sometimes they are in the same building). In a technical school a person

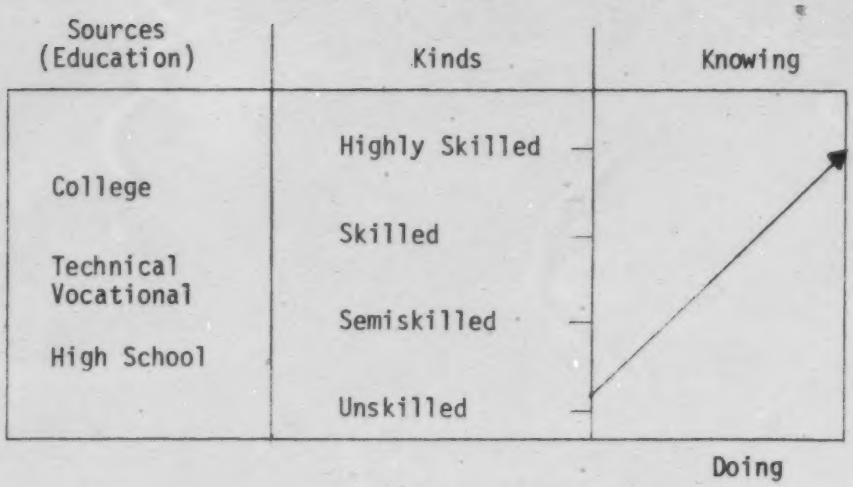
studies more about *why* something works. The vocational school teaches one how to do or *perform* a job. Thus, in a technical school, an individual is trained more in using his mind, whereas, in the vocational school, one is trained more in using his hands. A 'technician' (as a graduate of a technical school is called) is not trained for any one specific job, but can be employed in any number of different positions. The vocational-technical school graduate is trained to be employed in a semiskilled/skilled kind of manpower occupation.

Everyone, it seems, has heard talk about someone going to this college or that. Why do these people go to college? They are most likely aware of some of the jobs that a college graduate can obtain. These are the highly skilled kinds of jobs that use human resources. Can you think of some jobs that need highly skilled people to work in them? Do you know anyone who has a college education? If so, what type of job does that person do?

Kinds of Human Resources

You have read about and perhaps seen a number of different sources of manpower. The human resources that come from each *source* have different *kinds* of human abilities. The different kinds can be related to the amount of skill (*doing* something) and amount of knowledge (*knowing* something) needed to perform any job. Look at the chart on the next page and notice the kinds of human resources - unskilled, semiskilled, skilled and highly skilled.

CHART - LEVELS OF MANPOWER



How are they related? Notice how the areas of doing and knowing change as the kinds of skill change. As a job changes from unskilled to highly skilled, the doing part decreases and the knowing part becomes more important. Also, look at how the sources change along with the skill and doing/knowing. The educational qualifications change as the kinds and doing/knowing areas change.

Below is a list of examples of the kinds of human resources used by industry.

Unskilled:
- common laborer
- delivery/paper boy
- janitor
- sales person
- waitress

Semiskilled:
- cook
- draftsmen
- key-punch operator
- secretary
- stewardess
- truck driver

Skilled:
- carpenter
- chef
- design draftsman
- electrician
- lab technician
- plumber
- printer
- teacher

Highly Skilled:
- architect
- computer programmer
- doctor
- engineer
- lawyer
- pilot
- university professor

Can you think of any more jobs you could put under each area? Are there jobs that could fit into one or more areas? What about a computer programmer, a secretary, or a maintenance engineer (not a janitor)? Some of these could fit into one or more areas. So, keep in mind that there are always exceptions. These areas of manpower are not always clear and well defined. And this is as it should be, because not all people are alike.

Characteristics of Human Resources

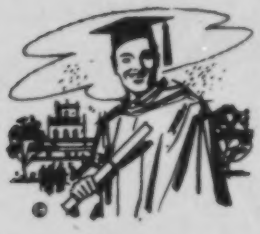
Each kind of human resource - unskilled, semiskilled, skilled, and highly skilled has characteristics that make each kind different. The education and sources of human resources also give distinct characteristics to different kinds of jobs.

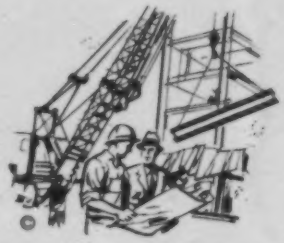
For example: The type of life you live would be different if you were a doctor compared to a "ditchdigger." Compare these or two other types of jobs. Picture them in your mind and ask: What type of house would you live in? What kind of car would you own? What would you do with your leisure time? How many hours would you work each week? Would you have to be ready to go to work at any time of the day or night? Will

your job exist in five to ten years? Can you live at home or will you have to travel and move around a lot? How much responsibility does your job have? Are you supposed to guide and tell others what to do? Do people's lives depend on your decisions? Or do you just do what people ask you to do?

The answers to these questions distinguish characteristics that each kind of job has. They bring out characteristics such as: *life style expectations* (what will the style of life be), *duration of employment* (how long will the job last), *commitment to the job* (how much of my time and energies will the job demand of me), *extent of responsibility* (how much responsibility will be directly on my shoulders).

Sometimes just by knowing what a person's job is, you can tell the types of things the person does and how he lives.





Activity: Manpower - I-1A

Name _____

Period _____

What are Human Resources?

Question: Define human resources in your own words.

Activity: Manpower - I-2A

Name _____

Period _____

Sources of Human Resources

Question: Name three sources of human resources.

Activity: Manpower - I-2B

Name _____

Period _____

How to Complete a Contract

Procedures:

1. Obtain an apprentice contract from a local union.
2. Read the contract.
3. Fill out the application.
4. List some things that you learned about an apprenticeship contract.

Activity: Manpower - I-3A

Name _____

Period _____

Kinds of Human Resources

Directions:

1. Identify the three different kinds of human resources.
2. Explain or show graphically how these differ from each other.

Activity: Manpower - I-3B

Name _____

Period _____

Kinds of Manpower

Procedures:

1. Participate in the following activities during the next few class periods:

   a. sweep the floor in the lab.

   b. maintain or replace a tool or piece of equipment in the lab that needs maintenance. (ask the instructor for suggestions)

   c. operate or use a tool or piece of equipment in the lab with which you are familiar.

   d. ask one of your instructors if they have any assignments that you could correct or grade for them.

2. After you have completed the activities above:

   a. think about the kind of skill required for each job (and similar jobs too).

   b. list the name of each job you participated in (or you may list a job you had outside of school) and name the kind of skill needed for the job.

Activity: Manpower - I-4A

Name _____

Period _____

Characteristics of Human Resources

Procedures:

1. Obtain a copy of The Occupational Outlook Handbook from the library or resource center.
2. If you are unfamiliar with using this reference, ask the librarian or resource personnel to show you.
3. Choose one of the following and locate it in the Handbook.
   a. Your father's or mother's occupation.
   b. An occupation of someone you know.
   c. An occupation in which you are interested.

   (You may have to ask one of the above for his or her exact job title to look it up)
4. Read about the job and its "outlook" for the future.
5. In a few sentences, write a short summary about the information you found.

Activity: Manpower - I-Terminal A Name _____

Period _____

Human Resources

Procedures:

1. Obtain a copy of The Dictionary of Occupational Titles from the library or resource center.

2. If you are unfamiliar with using this reference, ask the librarian or resource personnel to show you.

3. Choose one of the following and read the information listed about it in the Dictionary of Occupational Titles.

   a. Your father's or mother's occupation.

   b. An occupation of someone you know.

   c. An occupation in which you are interested.

   (you may have to ask one of the above for his or her exact job title in order to look it up)

4. Read the job description and duties under the job title you selected

5. Write:

   a. A short description and duties of the job.

   b. Does the description agree with what you thought the job was or what the person does?

   c. Briefly explain why or why not it did not agree.

Activity: Manpower - I-Terminal B Name _____

Period _____

Human Resources

Procedures:

1. Identify a number of jobs in a group that are related to each other. Select one of the following:

   a. Jobs that each student has in the lab (personnel plan).

   b. Jobs that were used or are going to be used to operate an enterprise in the class.

   c. A list of jobs that an industry in your town uses.

2. Using the Dictionary of Occupational Titles and the Occupational Outlook Handbook:

   a. list the qualifications for each job.

   b. identify the kind of skill required for each job.

Activity: Manpower - I-Terminal C Name _____

Period _____

Human Resources

Directions:

1. If arrangements can be made, visit a local vocational or technical school.
2. Ask someone, while at the school, how they decide what should be taught.
3. Obtain a list of classes that are offered and employment opportunities where you could work after completing these classes.
4. List what some of the characteristics of one of these jobs would be, that is, life style, expectations, length of employment, etc.

Student Evaluation

Human Resources

Name _____

Instructor _____

School _____

Directions: Answer all of the following questions to the best of your ability. The questions are written to evaluate your knowledge and understanding of the area of industrial arts covered in this package. Choose the answer which best completes the statement.

1. People with individual talents and skills which are important to industry in producing goods and services can be called

   a. Human Resources
   b. Manpower
   c. 'People-power'
   d. All the above

2. A gas station, department store, lumber yard, or factory would not be able to produce, sell, or service anything if there were not people to work in them and manage them.

   a. True
   b. False

3. An employment agency interviews people and matches their qualifications with jobs they have listed from the industries.

   a. True
   b. False

4. Which of the following is not a source of Human Resources?

   a. Employment agencies
   b. Apprenticeship programs
   c. Schools
   d. None of the above

5. Which type of school trains people to know why something works?

   a. Vocational school
   b. Technical school

6. Which type of school teaches people how to do or perform a job?

   a. Vocational school
   b. Technical school

7. Carpenters, chefs, plumbers, and teachers are usually referred to as _____ manpower.

   a. Unskilled
   b. Semiskilled
   c. Skilled
   d. Highly skilled

8. Cooks, secretaries, truck drivers, and draftsmen can usually be referred to as _____ manpower.

   a. Unskilled
   b. Semiskilled
   c. Skilled
   d. Highly skilled

9. Architects, computer programmers, engineers, doctors, and lawyers are usually referred to as _____ manpower.

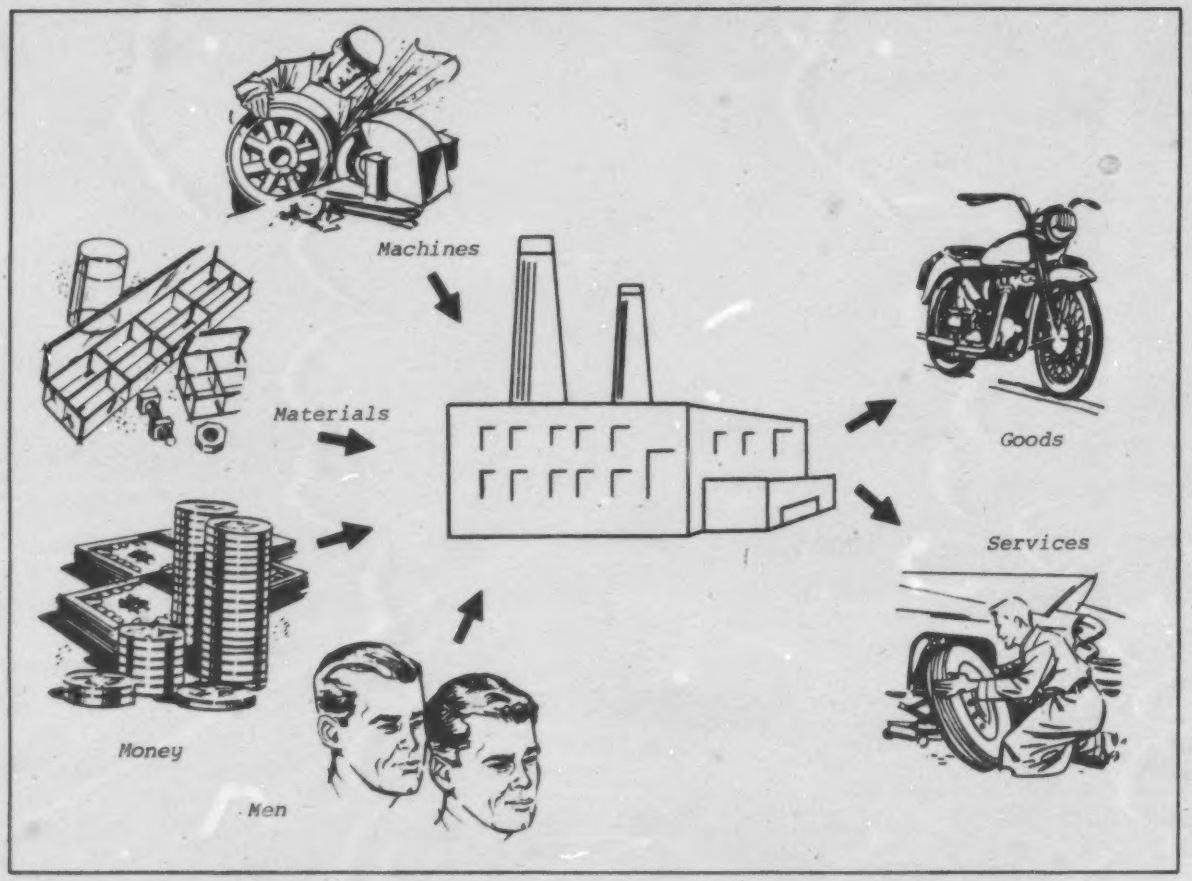
   a. Unskilled
   b. Semiskilled
   c. Skilled
   d. Highly skilled

10. Common laborers, sales persons, waitresses, and janitors can be referred to as _____ manpower.

    a. Unskilled
    b. Semiskilled
    c. Skilled
    d. Highly skilled

HOW DOES MANAGEMENT AFFECT INDUSTRY AND SOCIETY ?

JUL 25 1975



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Learning Activity Package

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Management

Junior-Middle High School

Pertaining to Field Objective Number Two

"To understand the interdependence of society
and industry as related to management."

Produced by

The Industrial Education Instructional
Materials Development Project
University of Wisconsin-Stout
Menomonie, Wisconsin

Project Director:

Lawrence S. Wright, Ed.D.

Assistant Director:

M. James Bensen, Ed.D.

Project Coordinator:

John M. Ritz, M.S.

Contributor to this Package:

John Ritz

Supported by:

The Wisconsin Department of Public Instruction;
The Graduate College and the Center for Vocational,
Technical and Adult Education, both of the
University of Wisconsin-Stout

RATIONALE:

In the not too distant future, all of you will become contributing members of our society. In order to contribute to its well being, you must develop understanding and knowledge of the world in which you live. Since our society is industrial in nature, it is important for you to understand the interdependency that exists between industry and society. All important decisions in industry are made by the people who own and operate the companies and businesses, the management. Because management makes the decisions for industry, we will study the interdependence of society and industry as a phase of management. It is for this reason that the management element exists - to coordinate. In other words, it exists for the purpose of bringing resources together so that the company may operate and produce for society.

This package is designed to help you to understand how industry functions in our society. It falls in the study of management and should tie many other aspects of your study of our industrial society together.

Please turn to the next page and read the objectives carefully!!

OBJECTIVES:

Terminal Objective:

To understand the interdependence of society and industry as related to management.

Enabling Objectives:

At the conclusion of this lesson you will:

1. List at least five examples of societal management that exist in your communities.
2. List at least five societal situations with an example of each in which society and industry coordinates their managerial actions.
3. Write a letter of application for a particular job from a given list of employment descriptions.

Options: Read the self-test on the following pages and then check the following selections that apply to you.

_____ If you feel you can meet the above objectives:

_____ A. See the instructor for a teacher evaluation

_____ B. Take the self-test as a self evaluating device, then see your instructor.

_____ If you feel you cannot meet the above objectives:

_____ A. Take the self-test to see what objectives your studying should be based upon, then turn to the media section on page 3.

_____ B. Skip the self-test and turn to the media section on page 3 to help you achieve the objectives.

Self-Test: You may write in this booklet.

1. What are five examples of societal management that exist in your community?

   1.

   2.

   3.

   4.

   5.

2. What are five societal situations in which society and industry coordinate their managerial actions? List an example of each situation.

   1.

   2.

   3.

   4.

   5.

3. In the space below and on other paper if needed, write a letter of application for one of the following jobs: Waitress at an A&W Rootbeer stand, paper boy or girl with the city news, stock boy at Smith's Five and Dime, or sales girl at Teen Fashions.

MEDIA SECTION:

Read the information section of this package and complete the three activities located at the end of this lesson.

Management in Your Community?

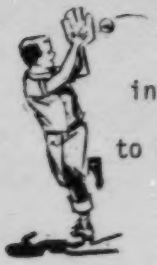
The answer to this question is yes. If you live in a very small community, it may not seem as apparent as in a larger town, though all areas have some type of management. In a very small town, the inhabitants may have only formed committees to carry out certain functions, while large communities have organized governments. Following will be a section covering the societal managing bodies that do exist in most communities.

City Government. Generally all organized communities have a governing body. This body is composed of persons of the community that have been elected by its citizens. The main governing positions in any town government include its mayor and councilmen. Minor positions include the secretary, treasurer and others. This group of people manage the community. They decide what laws and ordinances shall be made to help the community and also how tax moneys are to be used.

City Departments. Within the city government are located many departments which were formed to help the citizens of the community, the taxpayers. Can you think of any of these? Management departments organized within the city government for the citizens include the police, fire, parks and recreation, water and sewage, highway and special committee departments. These groups help to manage the community in which they are organized.

Community Organizations. The final class of the city managing group is organizations. Some of these are the Chamber of Commerce, Jaycee's, Rotary Club, Lions

Club, church groups, Business Mens Association, etc. All of these groups



are not directly related to the city government, but often influence its decisions. The purpose for these organizations is to help the citizens in the community.

When Does Society and Industry Coordinate Their Managerial Actions?

This question is similiar to the one that asks, "When does society and industry communicate." The answers to both are, "Continuously, every day." Since an information section has already been prepared covering the dynamic societal situations in which industry and society communicate, this section will also be used to explain how society and industry coordinate their management actions. The reason for this is that the management and communication elements are both coordinating elements of industry. As coordinating elements, they are required within each industry for the purpose of bringing resources (people, materials, finance, energy, and property) together so that the company may operate to produce goods and services. Following are the dynamic societal situations that confront industry. They have been written to deal with communication, but management makes the decision for industry and society to communicate.

Supply and Demand. This merely means that what industry produces is determined by the demands (wants and needs of society - population). Examples of where industry and society communicate concerning supply and demand are the following, though this list is not complete:

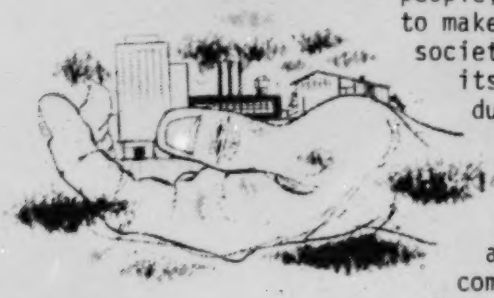
1. Construction companies build homes when people need them. Society lets industry know through various means of communication what they want and when and where they need the homes.

2. Society lets industry know what it wants to eat through mass communication, so the farmers produce the required products to meet the needs of man.

3. Individuals let automobile manufacturere know what kind of cars they want, so manufacturers produce these cars to meet the needs and demands of society.

Industrial Assets. This dynamic societal situation means that industries provide assets to the communities in which they are located; communities become dependent upon these assets from industry. Examples of industrial assets are the following:

1. When a company moves into an area, it provides jobs for the people, and the people depend on these jobs to make a living. Industry communicates to society by stating it needs employees for its company, and the community lets industry know that it cannot survive without it.



2. By an industry moving into an area, it brings people with it that need goods and services of the community. The community communicates to the company and lets its employees know that it can provide the demands they desire. These are stores and service companies.

3. A company could require air transportation to move its products so they may build an airport. The company could communicate to the townspeople, and allow the airport to be used by them. They can become dependent on its services to have mail delivered and other goods and services required.

Location of Industry. Communication takes place in this instance by the fact that industries are attracted to and are dependent upon areas in which there are human and natural resources; people are attracted to areas in which industry exists. Following are some possible instances in which society and industry communicate with respect to the location of industry:

1. A company may need a plentiful supply of water for cooling during its manufacturing process, so it communicates to society for a possible plant location along a river, where there is a large enough population to work in the company. Society is attracted to this area because industry communicates to society that it needs employees, plus there are other opportunities to make a living.

2. A research company may need qualified technicians to perform their technical tasks, so it may move to a location near a university. Other qualified persons from society may move to the area to seek employment with this firm.

Human Resources. In this dynamic societal situation, communication takes place when industry depends on human resources to accomplish its goals and man depends on industry to fulfill his needs. Following are some examples of how communication takes place between industry and society as related to human resources:

1. In order for a milk producing company to get milk cartoned and delivered to the people, it needs employees. The company communicates in hiring persons to do this work, and the people who are hired are dependent on the company to produce the milk for their family's needs.

2. An industry that produces automobiles needs society to work in the plant to produce cars. The company communicates in advertising the jobs to be filled by society. Society depends on the car manufacturing company for transportation.

Financial Dependencies. In this communication situation, man as a member of society is dependent upon industry for his financial support; industry is dependent upon society for its financial support. Some examples are the following:

1. A man works at a newspaper company to support his family. In the newspaper there are communications, news and advertising. Some people buy the papers and the company is dependent on these people to make a profit, and to pay its costs and employees.

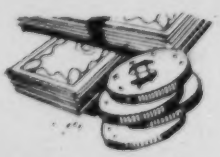
2. A television repair company advertises (communicates) in a newspaper that it needs qualified people to work for them for a certain wage. People take these jobs to have an income. When the people work for this business, they produce services for society. Through these services, the company makes money form society.

Environment and Industry. Here industry and society communicate by the fact that industry operates to meet the needs of man and creates an environmental imbalance that is subject to limitations imposed by society. Society lets industry know when it is displeased with what industry is doing to its surroundings. Some examples of this situation are as follows:

1. Society demands energy to meet its needs, so consequently a coal company strip-mines the landscape to obtain this coal to produce energy. Society does not like what this company is doing to its environment. Therefore, society communicates to the coal producers by passing laws which state that the coal companies must improve the sight of the areas in which it has strip mines.

2. Society demands iron to produce its cars and homes. The steel companies extract the iron from raw materials, producing annoying air pollution. Society wants clean air, so it tells industry to improve their production process through articles in newspapers and magazines, shows on television and by passing laws.

Profit Factor. This societal situation states that the satisfaction of industry's motivation is partially dependent both upon man as a resource and as a consumer. For industry to make a profit, it must hire the cheapest labor which can perform its jobs correctly and sell its products at the highest price permitted by society. Following are examples of this societal situation:



1. A tire producing company exists only to make a profit. Therefore, it will communicate to society to hire people and will pay these people the least amount that the unions will allow. When the tires are produced, the company communicates by use of television and newspapers to society and advertises that they are selling tires at a certain price. This is the highest price that society is willing to pay to obtain the tires.

2. A milk producer buys milk as cheaply as he can from the farmers. The producer also hires labor for his company for as little wages as possible. Then after the milk is packaged, the producer sells it to society for the highest price that the government will allow, in order to make his biggest profit.

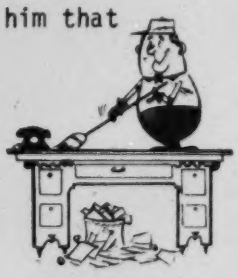
Other Ways. Industry and society also communicate when industry wants to buy land, resources and mineral rites from society. In today's "new world", society is communicating to industry their need for more energy and stronger air pollution controls. Other examples where industry and society are communicating is in community activities. Many industries are helping communities. They are clearing land for recreation and giving donations to support community affairs.

Letter of Application.

In order to survive in society, employment is generally a requirement. If you do not have someone to support you (provide food and shelter), life can be very unbearable. To obtain employment, it is a requirement to be able to communicate to the management of industry. One way of doing this is by writing letters of application to companies.

*"Letter writing has recently been called one of the 'lost arts', many job candidates have lost the chance for economic advancement and a position because of carelessly written letters of application. Therefore, because a good letter of application is an important factor in obtaining a good position, make certain that the preceding statement does not apply to you."

"Your letter will tell the prospective employer many things about you: You will be judged on your ability to write, to think and to express yourself intelligently. A good letter of application must communicate and establish a rapport between you and prospective employers. You must keep in mind that the reader also has needs and interests. It is then important that you capture his attention and convince him that your experience, training and talents qualify you for the position."



The following suggestions for letters of application for employment may prove helpful:

A. Use good quality white paper, 8 1/2" x 11", with matching envelope.

B. Either type the letter or write it longhand (typed is preferred).

C. The block open form, with no punctuation at the end of lines in the heading and with no abbreviations, is recommended. Address it to a specific person, using his correct name and title. Space the letter attractively, keeping margins straight. It is important that you follow-up on your letters of application either with another letter or a telephone call.

A sample letter of application and the form to be used is included on the following pages:

*Much of this information has been taken from the UW-Stout, "Career Planning and Placement Services" booklet.

Form for a Sample Letter of Application or Inquiry

(Business/Industry Positions)

Your street address
Your city, state and
zip code

Date

Name of Employing Official (if known)
Title
Company Address
City, State and Zip Code

Dear Sir: (Name inserted for sir if known)

In this paragraph state that you have been informed of a vacancy in their company in your major interest. Indicate your interest in the area and the position and request information regarding procedures to be followed in applying for this position or state that you are definitely applying for this position.

In this and/or following paragraphs, describe your qualifications based on education and experience. If certain qualifications are listed in the job description, tell how you are qualified to meet them.

In the final paragraph, write an appropriate closing to pave the way for an interview, by asking for an application blank, by giving your telephone number, or by offering some similar incentive for an immediate and favorable reply.

Sincerely yours,

Your Signature

Your Name (typewritten)

Sample Letter of Application

9100 Stout Road
Downsville, Wisconsin 54735
January 30, 1974

Mr. John J. Jones
Quick Shoe Store, Manager
1900 University Circle
Menomonie, Wisconsin 54751

Dear Mr. Jones:

Through our Downsville Junior Employment service I have been informed that your store is in need of a part-time stock boy. I am very interested in this position and would like to be considered an applicant.

I am presently attending Menomonie High School and in the Junior class. My studies are concentrated in the area of distributive education and I am very much interested in gaining some practical experience in this area. I will be available to work part-time during the following school year and full time during summer vacation.

You may contact my school for further recommendations by my distributive education teachers. Your consideration will be appreciated and I look forward to hearing form you regarding this position. An interview can be arranged at your convenience.

Sincerely yours,

Frank A. Brown

Frank A. Brown

Activity: Management - II-1

Name _____

Period _____

Directions: List at least five forms of societal management that exists in your community. Briefly try to explain how each one performs the function of managing.

Activity: Management - II-2

Name _____

Period _____

Directions: List at least five societal situations with an example of each in which industry and society coordinate their managerial actions.

Activity: Management - II-3

Name _____

Period _____

Directions: Using the list of employment descriptions provided by your instructor, write a letter of application for a particular job from the list. Attach the letter to this page and hand it in for teacher evaluation.

Student Evaluation

Management - II

Name _____

Instructor _____

School _____

Directions: Answer all of the following questions to the best of your ability. The questions are written to evaluate your knowledge and understanding of the area of industrial arts covered in this package. Choose the answer which best completes the statement.

1. Which of the following is not an example of a societal managing body?

   a. City government
   b. City departments
   c. A local industry
   d. Community organization

2. Construction companies build homes when and where people need them. Community governments let the management of construction companies know that its community is expanding and needs homes. What dynamic societal situation is involved in this management action?

   a. Supply and demand
   b. Profit factor
   c. Environment and industry
   d. Financial dependencies

3. Which of the following societal situations is concerned with the fact that industries are attracted to and are dependent upon areas in which there are human and natural resources?

   a. Supply and demand
   b. Location of industry
   c. Financial dependency
   d. Profit factor

4. The following is an example of which societal situation: society demands energy to meet its needs. A coal company strip mines an area to obtain coal to produce energy but scars the landscape.

   a. Industrial assets
   b. Supply and demand
   c. Location of industry
   d. Environment and industry

5. Industry wants to produce products and services as cheaply as possible. It also wants to sell these products for as much as they can. Which societal situation affects industry here?

   a. Environment and industry
   b. Financial dependencies
   c. Profit factor
   d. Industrial assets

6. Which of the following is not important in writing a letter of application?

   a. Use good quality white paper
   b. Neatly write or type the letter
   c. Follow-up the original letter
   d. Use letterhead paper

7. Which of the following should be included in a letter of application?

   a. Your interest in the position advertised
   b. Description of your qualifications
   c. Pave the way for an interview
   d. All of the above

8. To obtain employment, it is a requirement to be able to communicate to the management of industry.

   a. True
   b. False

9. In writing a letter of application for a job, you will be judged on the following characteristics.

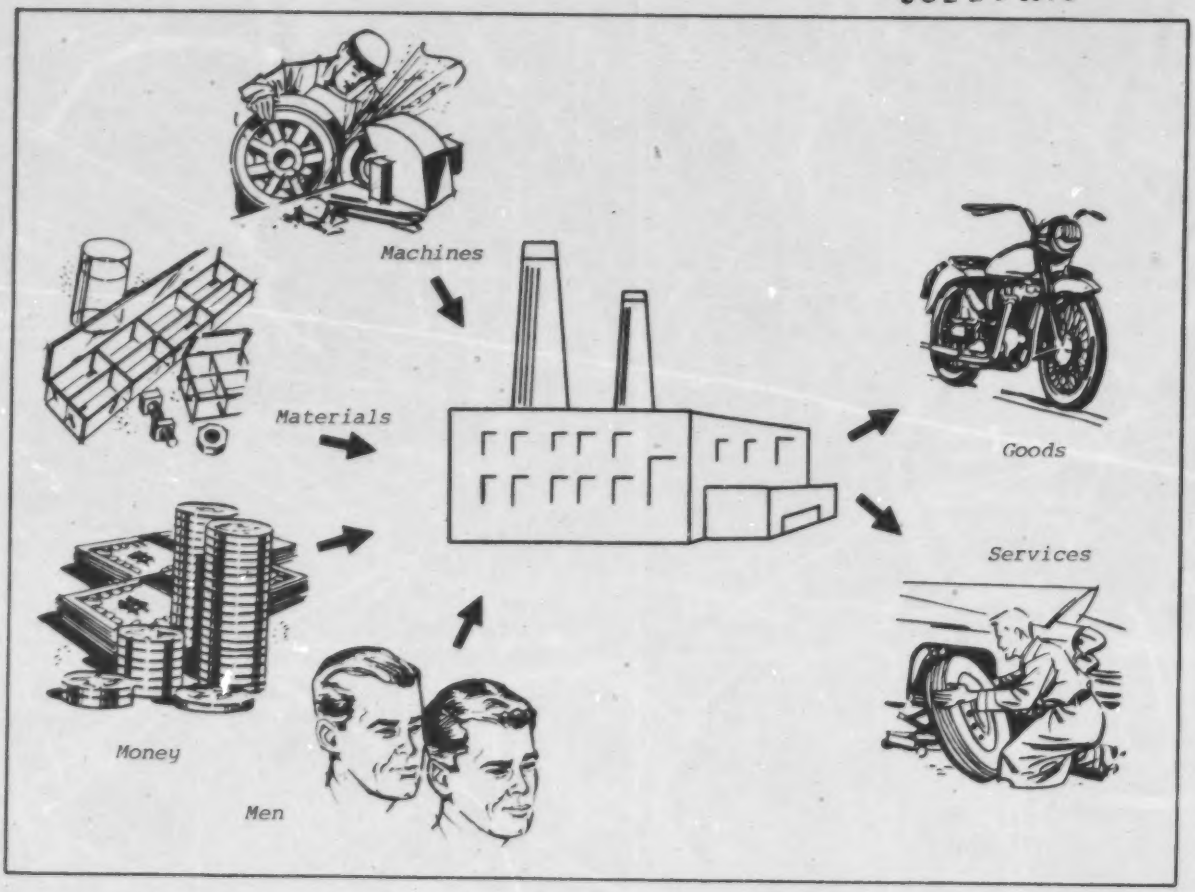
   a. Ability to write
   b. Ability to think
   c. Ability to express yourself intelligently
   d. All of the above

10. In writing a letter of application you must:

   a. Capture the attention of the person you're writing to
   b. Convince him that you are experienced
   c. Describe your training and talents
   d. All of the above

WHAT IS PROPERTY

JUL 25 1975



Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Learning Activity Package

Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Property

Junior-Middle High School

Pertaining to Field Objective Number One

"To work with the property element of
industry to gain an understanding of how
it functions in producing goods and services."

Produced by

The Industrial Education Instructional
Materials Development Project
University of Wisconsin-Stout
Menomonie, Wisconsin

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Contributor to this Package:

John Ritz

Supported by:

The Wisconsin Department of Public Instruction;
The Graduate College and the Center for Vocational,
Technical and Adult Education, both of the
University of Wisconsin-Stout

RATIONALE:

Another element of industry and society is that of property. Property refers to those things that we and enterprises own and place a value. Our clothing, homes, and bicycles are all examples of property.

Can you think of items you have that would be considered property?

What are some examples of property held by industry?

This lesson explains the importance of property to industry. You should become familiar with it so you will understand the role it plays in industry in producing goods and services.

Please turn to the next page and read the objectives carefully!!

OBJECTIVES:

Terminal Objective:

To work with the element of property in order to gain an understanding of how it functions in producing goods and services.

Enabling Objective:

At the conclusion of this lesson you will either orally or in writing:

1. Define property in your own words.
2. Explain the following sources of property - purchased, inherited, and granted.
3. Explain the following kinds of property that exist in our society - land, buildings, equipment, materials, capitol, patents and rights.
4. Explain and distinguish between real and intangible kinds of property.

Options: Read the self-test on the following pages and then check the following selections that apply to you.

_____ If you feel you can meet the above objectives:

_____ A. See the instructor for a teacher evaluation.

_____ B. Take the self-test as a self evaluating device, then see your instructor.

_____ If you feel you cannot meet the above objectives:

_____ A. Take the self-test to see what objectives your studying should be based upon, then turn to the media section on page 5.

_____ B. Skip the self-test and turn to the media section on page 5 to help you achieve the objectives.

Self-Test: Answer the following questions. You may write in this booklet.

1. What is the definition of property as related to industry and society? You may write this in your own words.

2. What is the meaning of each of the following sources of property? List two examples of each.

   A. Purchased -

   B. Inherited -

   C. Granted -

3. Explain the following kinds of property that exist in our society:

   A. Land -

   B. Buildings -

   C. Equipment -

D. Materials -

E. Capitol -

F. Franchises -

G. Patents -

H. Rights -

4. What does real and intangible mean? What is the difference between these forms of property? What are five examples of each?

MEDIA SECTION:

Objective Number 1: Define property in your own words.

Optional Media: Choose one or more.

___ 1. Read the information on pages 6 to 7 of this package.

___ 2. Read Organizing an Industry, American Industry Student Handbook, pages 43-48.

___ 3. Movie "Refinery at Work," free, 21 min., color film from ROA'a Films.

Optional Activities: Complete one or more of the following activities: Property - I-1A thru 1D.

Objective Number 2: Explain the following sources of property - purchased, inherited and granted.

Media: Read pages 7 to 8 of this package.

Optional Activities: Choose one or more of the following activities: Property - I-2A thru 2C.

Objective Number 3: Explain the following kinds of property that exist in our society - land, buildings, equipment, materials, capitol, patents and rights.

Media: Read pages 8 to 10 of this package.

Optional Activities: Choose one or more of the following activities: Property - I-3A thru 3C.

Objective Number 4: Explain and distinguish between real and intangible kinds of property.

Media: Read page 10 of this package.

Optional Activities: Choose one or more of the following activities: Property - I-4A and 4B.

Objective Numbers 1 thru 4: Activity: Property - I-Terminal

INFORMATION SECTION

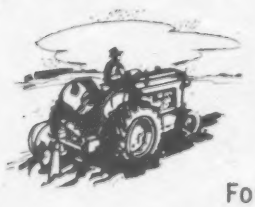
What is Property:

Property can be defined as holdings or possessions which you or an enterprise (company or business) have upon which a value can be placed. There are many examples that can fit this definition. Some examples of property that an enterprise may hold are money, buildings, land, materials, equipment, patents, etc. All of these examples have value. They can be bought and sold for money.

Can you think of any kinds of property that you or your family hold? Would your father's car be considered property? It would since a value can be place upon it. He could sell it and receive money in return.

What are some other examples of property your family possesses? Some of these could be a home, food, clothing, books or coin collections. Can you think of any others?

Let's examine the possessions of a farmer. He usually owns many forms of property. He has land which he can use to grow crops and graze animals. He has a home and farm buildings which are forms of property.



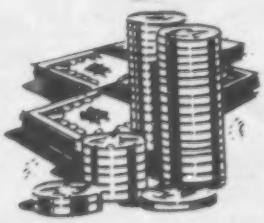
Also, he has machines and equipment which he uses to work his farm. These are forms of property. He may also have invented a certain piece of farm equipment. For this he may have a patent (an official document saying no one else can make and sell the equipment that he has invented). He could place value on this document because he could sell it to a company for a profit. Because of this, it would be considered property.

Can you list any other forms of property the farmer may possess?

Sources of Property

Now that you understand what property is, let's study the sources or means of obtaining property. When your father got his car or home, how did he get it? Did he purchase it? Did he inherit it? Was it granted to him?

These are the three sources or ways of obtaining property - purchased, inherited and granted. Following will be a description of each:



Purchased Property When property is purchased, the person who is making the purchase gives something of value, in order to receive the goods or services. The value is typically money, but can be other things. It could be stock, land, materials or other valuables. When you want a new coat, you usually buy it with money. This is an example of purchasing property. Can you think of other examples?

Inherited Property. This is property received by the laws of inheritance. When a friend or relative dies, a person may receive property through a will or by law. You may have inherited some form of property from a relative. Often land and homes are received in this manner. Many times jewelry and other valuables are passed down through a family by the means of inheritance. Small companies and businesses often exchange hands through this source of property exchange. Can you think of any property that your family has inherited? What are some examples of where inheritance has taken place in industry in obtaining property?

You may not have an answer to this question. An example could be that a father may die and leave his enterprise to his son.

Granted Property. This source of obtaining property involves the transfer of property by a deed. When property is granted, the person or group receiving it does not pay for it. Companies often grant land (kind of property) to communities so they can build recreation areas. Wealthy members of our society grant money or other forms of property to colleges, hospitals or other needy organizations. You could even say that when your parents gave you $10.00 for your birthday, this was granting property.

Kinds of Property

As you have already found out, property can be identified as holdings or possessions of an enterprise upon which value can be placed. In the examples that were used previously in this lesson, many different kinds or types of property were identified. This section will cover the major kinds of property found in our society and briefly explain each.

Land. This is ground or soil which is considered property. It can be farm land or city property. Its value will be determined by where it is located and for what it can be used.

Buildings. They are structures owned and used by enterprises or society. Your home is an example of this type of property. Train stations and airports are also types of property. Factories often use many buildings in their production of goods. All of these buildings would be labeled property.

Equipment. This form of property can be identified as furnishings needed so that an enterprise may operate successfully. Equipment may also be listed in two groups. These are furniture and machines. Furniture is moveable equipment that does not produce goods. They provide some means of comfort. Chairs, desks, beds and sofas would be labeled examples of property that would be called furniture. Machines are the other group of equipment. They are forms of equipment that produce goods. Typewriters, hammers, drill presses and saws would be considered types of machines. Equipment comes in many shapes and sizes and helps humans in their daily lives by making work easier.

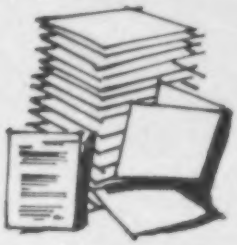
Materials. Another kind of property that is valued in our society is materials. They are either raw, semi-processed or finished. Industry uses these to produce products. Some very valuable materials are gold, silver and diamonds. Most other materials that exist in our society also hold a value. They can be sold to companies for producing products.

Rights. This kind of property exists in the form of written permission. There are various types of rights. Two of the most common are copyrights and rights of way. A copyright is written permission which gives authority to reproduce, publish and sell writings and works of art of others. It usually deals with obtaining permission to copy written literature such as books.

A right of way means obtaining permission to cross land owned by others. Constructing, timbering and mineral companies often value this form of property. They use it to gain access to lands. Many times one of these

companies must cross private lands to reach its working areas. They need permission (right of way) from the land owners to cross this property to reach their work areas if public roads do not exist.

Patents. This kind of property is an official document giving special privileges to an inventor. If a person or a company invents a product using special parts or processes, they may obtain a patent from the government. This patent states that no other company can produce the same product in the same way. If they do, it will be breaking the law. Whenever you purchase something from the store, look on the back side of it and you will usually find a patent number. These are recorded by the government.



Capitol. The final kind of property we are going to discuss is capitol. It is money that you or an enterprise has on hand. This type of property is valuable due to the fact that a company will be able to pay its bills or possibly expand. Usually you or a company does not have a large amount on hand. It is usually in the bank or invested elsewhere.

Real and Intangible Property

Now that you know the various kinds of property, we can classify them into two forms. They are either real or intangible property. Real property is physical in nature. By this, it can be seen, felt or touched. Examples of real property are the following: land, buildings, equipment and materials.

The other form of property is intangible property. It is property that appears in the form of paper (money, stocks, bonds, deeds, copyrights, patents, etc.) or estimates (good will - what people are willing to do for you). Both are forms into which property may be characterized. Can you think of any other forms of real and intangible property?

Activity: Property - I-1A

Name _____

Period _____

What is Property?

Directions: In the space below, write your definition of property. Also list all the items of property that you have in your room at home.

Activity: Property - I-1B

Name _____

Period _____

What is Property?

Materials:

1. Poster board or index paper
2. Colored markers or pencils
3. Definition of property
4. Scratch paper
5. Magazine clippings and pictures.

Procedures: Using the definition of property, construct a poster or collage that will define the term.

Activity: Property - I-1€

Name _____

Period _____

What is Property?

Directions: Talk to one of your parents and find out some forms of property that your family possesses. List these below. After you have a number of these listed, continue your conversation and determine a practical definition for the term property. Write this after your list of property.

Activity: Property - I-1D

Name _____

Period _____

What is Property?

Materials:

1. Real Estate section of your local newspaper
2. Camera
3. Clip board, paper and pencil

Procedures:

1. Look over the real estate section of your home town newspaper. Select two homes to compare. These should be approximately the same size according to the number of rooms. They should also be in different price ranges.

2. In your free time go to the location of these homes. If you have a camera, take pictures of each of them.

3. Using the following property value survey and the newspaper, go over each home and rate them on the survey.

Real Estate
Property Value Survey

	House #1	House #2
Location		
Size (no. of rooms)		
Price		
Style		
Size of lot		
Home finish (brick, stone, wood etc.)		
Garage (and size)		
Landscape		
Appliances furnished?		
Basement, finished		
Heat		
Others		

Activity: Property - I-2A

Name _____

Period _____

Sources of Property

Directions: Explain each of the following sources of property:

A. Purchased

B. Inherited

C. Granted

Activity: Property - I-2B

Name _____

Period _____

Sources of Property

Directions: List five examples in which you obtained property from each of the following sources (i.e. purchased a coat, inherited a necklace, etc.)

A. Purchased -

B. Inherited -

C. Granted -

Activity: Property - I-2C

Name _____

Period _____

Sources of Property

Directions: Using a bicycle as an example of property, explain how you could have obtained it from each of the following sources: purchased, inherited and granted.

Activity: Property - I-3A

Name _____

Period _____

Kinds of Property

Directions: Explain each of the following kinds of property:

A. Land -

B. Buildings -

C. Equipment -

D. Materials -

E. Capitol -

F. Patents -

G. Rights -

Activity: Property - I-3B

Name _____

Period _____

Kinds of Property

Directions: After each of the following kinds of property listed below, describe where you could find each of them, both in industry or society.

A. Land -

B. Buildings -

C. Equipment -

D. Materials -

E. Capitol -

F. Patents -

G. Rights -

Activity: Property - I-3C

Name _____

Period _____

Kinds of Property

Directions: When you produce products in your industrial arts shop, you use many forms of property. From the following list, choose the kinds of property you have used in making your projects or products and an example of how you used each kind. The kinds of property are land, buildings, equipment, materials, capitol, patents, and rights.

Activity: Property - I-4A

Name _____

Period _____

Characteristics of Property

Directions: Explain the meaning of each of the following terms related to kinds of property:

A. Real property

B. Intangible property

Activity: Property - I-4B

Name _____

Period _____

Characteristics of Property

Directions: Go into your laboratory or shop and list at least 30 examples of real property. Use this page.

Activity: Property - I-Terminal Name _____

Period _____

Analyzing Equipment

Directions:

1. Select a piece of portable equipment (electric hand drill, saber saw, router, electric soldering gun, portable sewing machine, etc.) that you would like to someday own.

2. You are going to conduct a consumer report on this piece of property.

Procedures:

1. Using at least five catalogs (Sears, Brodhead-Garrett, Penneys, and others) or making actual visits to stores, analyze the product. Use five brand names of the machine.

2. Construct a chart which will list characteristics of the property. Some of these could be cord length, balance, speed, horse power, case, accessories, guarantee, etc. You should list as many characteristics as possible.

3. Explain which brand name you would buy using your chart.

Activity: Property - I-Terminal Name _____

Period _____

Analyzing Equipment

Directions:

1. Select a piece of portable equipment (electric hand drill, saber saw, router, electric soldering gun, portable sewing machine, etc.) that you would like to someday own.
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2. Construct a chart which will list characteristics of the property. Some of these could be cord length, balance, speed, horse power, case, accessories, guarantee, etc. You should list as many characteristics as possible.
3. Explain which brand name you would buy using your chart.

Student Evaluation

Property

Name _____

Instructor _____

School _____

Directions: Answer all of the following questions to the best of your ability. The questions are written to evaluate your knowledge and understanding of the area of industrial arts covered in this package. Choose the answer which best completes the statement.

1. Property may be defined as

   a. An investigation and experimentation for the purpose of arriving at a solution to an identifiable need.
   b. Keeping something in the state of repair
   c. Obtaining and controlling money needed to develop and maintain an enterprise.
   d. Holdings or possessions which you or an enterprise have upon which a value can be placed

2. Which of the following is not an example of property?

   a. Money
   b. Patents
   c. Buildings
   d. None of the above

3. Which of the following is not used as a source of property for industry?

   a. Purchasing
   b. Inheriting
   c. Stealing
   d. Grants

4. Which of the following is the correct explanation for inherited property?

   a. Property for which you give something of value in order to receive it
   b. Property received through a will or by law when someone passes away.
   c. Property that has been transferred by deed
   d. None of the above

5. What kind of property can be identified as furnishings needed so that an enterprise may operate successfully?

   a. Buildings
   b. Land
   c. Equipment
   d. Materials

6. What kind of property can be identified as structures owned and used by enterprises and society?

   a. Buildings
   b. Land
   c. Equipment
   d. Materials

7. Which of the following kind of property exists in written permission?

   a. Buildings
   b. Land
   c. Equipment
   d. Rights

8. A patent is

   a. An official document giving special privileges to an inventor
   b. Money that you or an enterprise has on hand
   c. Permission to cross land owned by others
   d. Written permission which gives authority to reproduce, publish and sell writings and works of art to others

9. Land, buildings, equipment, and materials are examples of _____ property.

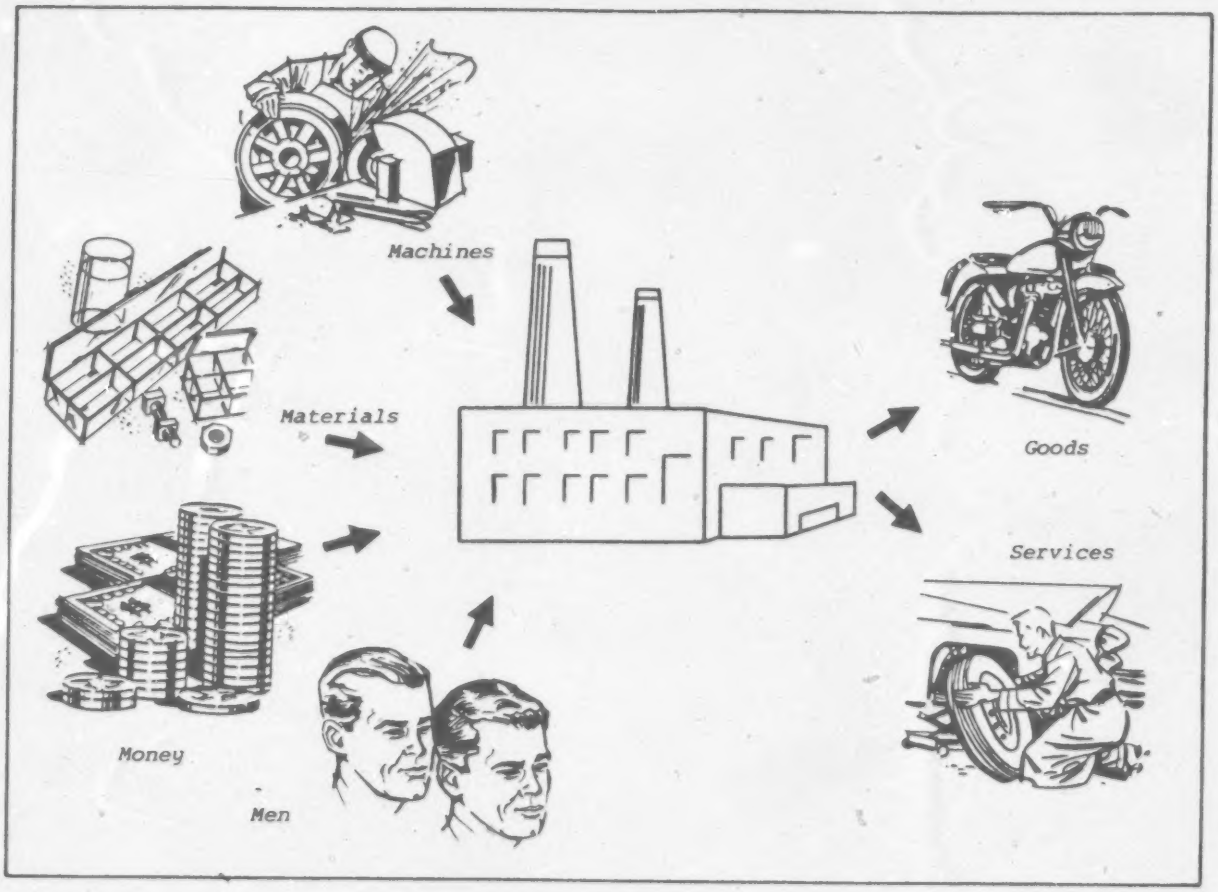
   a. Real
   b. Intangible
   c. All of the above
   d. None of the above

10. Money, stocks, bonds, deeds, copyrights, and patents are examples of _____ property.

   a. Real
   b. Intangible
   c. All of the above
   d. None of the above

LET'S MAKE A KITE

JUL 2 5 1975



Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

A Teacher Directed
Problem Solving Activity
Mass Production Activity
Individualized Activity

Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Let's Make a Kite

Pertaining to Field Objective One
and the following industrial elements

Research and Development Production

Materials Human Resources

Communications

The following industrial elements can also
be incorporated into this activity

Marketing and Distribution

Finance and Management

Produced by

The Industrial Education Instructional
Materials Development Project
University of Wisconsin-Stout
Menomonie, Wisconsin

Project Director:

Lawrence S. Wright, Ed.D.

Assistant Director:

M. James Bensen, Ed.D.

Project Coordinator:

John M. Ritz, M.S.

Contributor to this Package:

James Walker

Supported by:

The Wisconsin Department of Public Instruction;
The Graduate College and the Center for Vocational,
Technical and Adult Education, both of the
University of Wisconsin-Stout

RATIONALE:

Some Stories About the Development of Kites
(for teacher or student use)

The people of the Malay Peninsula had used the *Bow* or Malay kite for many centuries. It is thought that they borrowed the idea from the natives of Java, who were for a long time, the most expert kite makers in the world.

The box kite was invented about 1892, by Hargrave, an Australian, who later hoped to develop the kite for lifting observers. The idea was not new, as the Chinese and Japanese both have stories of man-lifting kites from long ago.

Kites are used not only for fun and sport. The U.S. Weather Bureau once used kites to study conditions of the upper atmosphere. They were equipped with a meteorograph that measured barometric pressure, temperature, moisture, wind, rainfall, sunshine, evaporation, etc. They made weather forecasts from this information. (How does the U.S. Weather Bureau make forecasts today? Are weather forecasts important? To whom?)

The U.S. government once had a professional kitemaker. He designed a triangular box kite with wings to be used by Admiral Byrd's Polar expedition. In case of a forced landing, they were to launch the kite with an aerial attached to locate their position.

The name Military Kite is used because a number of nations once experimented with kites of this type. It was reported that the Germans, during World War I, used kites such as these. They were huge kites. The correspondent giving the information indicated that cruising at a rate of 10 or 12 knots would give the necessary "run" to lift a light man 150 feet or so over the water. He did not say how the observer got down or what happened if the string broke.

To the Instructor:

Here are three activities center around kite building:

1. A problem solving activity
2. A mass production activity
3. An individualized activity

(A kite is used, but keep in mind that any item or product students are interested in making could be used in its place.)

1. The problem solving activity can be used to discuss and relate the types of processes the students performed to design the kite to the types of processes industry performs to design a product. For example, such things as research and development, building a prototype, testing, etc., can be discussed.

An example of a handout to get the students started (with some guidelines) is provided on page 4.

Some construction techniques and design ideas are also included. These can be given to individual students who may need some ideas to get started. These can be found on pages 5-12.

For those students who are less capable, the individualized package can be employed in place of the problem solving activity. This starts on page 13.

2. A mass production activity could also be employed to produce a kite. The following are some suggested activities and their relationship to indusiry:

- produce one of the better kites from the problem solving activity. (Research and Development)
- the class could vote on the kite they would like to produce. (Management)
- ask around school, at lunch, etc., and see how many people would be interested in buying a kite, and how much they would be willing to pay. (Market Survey)
- organizing the venture. (Management)
- obtaining money to buy materials and to start production. (Finance)
- getting everyone involved. (Relationships)
- produce a drawing of the product. (Communications)
- design of jigs and fixtures. (Production)

- layout a design or lettering on kite, (school name) e.g. screen process, printing, etc. (Graphic Communications Advertising)

- selling the product. (Profit or Loss, Marketing, Distribution)

3. A third alternative is an individualized activity. This could be used by less capable students or those who cannot handle the problem solving activities. An example is provided for the instructor that he can give students at his discretion. This starts on page 13 of this package.

For more information:

Hunt, Leslie L., 25 Kites That Fly, New York; Bruce, 1929

LaBerge, Armand J., Boats, Airplanes and Kites, Peoria, Illinois; Manual Arts Press, 1935

Miller, C.M., Construction and Flying of Kites, Peoria, Illinois; Manual Arts Press.

Chicago Park Board, Kite Craft and Kite Tournaments, Peoria, Illinois, Manual Arts Press.

Downer, Marion, Kites, New York, New York, Lothrop, Lee and Shepard Co., 1971.

Problem Solving Activity: (Student handout)

The Problem:

1. You are to design a kite:

   a. showing an efficient use of materials.

   b. having a minimum amount of weight.

   c. a maximum height of 40".

   d. work by yourself or with someone else.

2. The class will judge the kites. Some suggested things to evaluate might be:

   a. size vs. weight ratio.

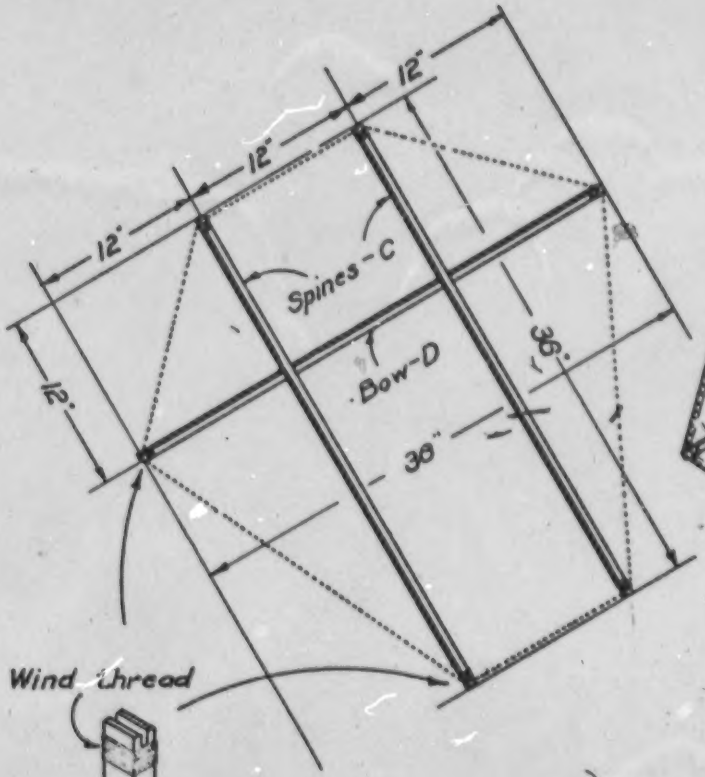
   b. how high it will fly.

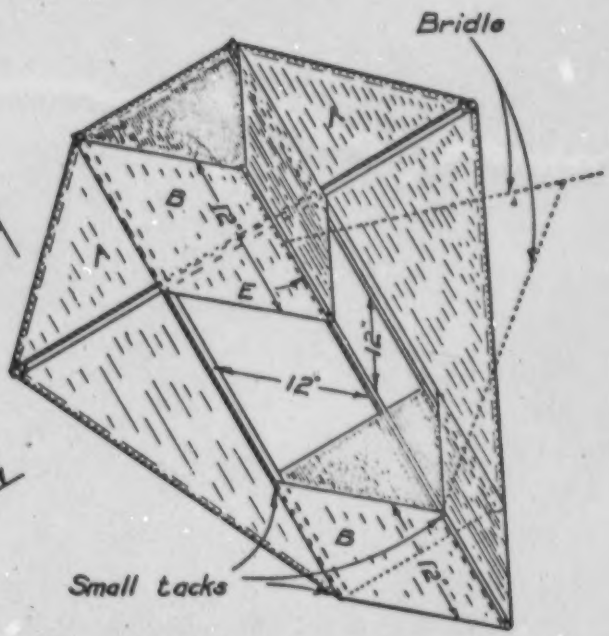
   c. how hard it will pull.

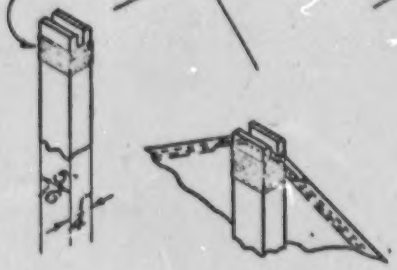
   d. original designs.

   e. decorations.

   Choose the one you like. Do you have any other ideas?



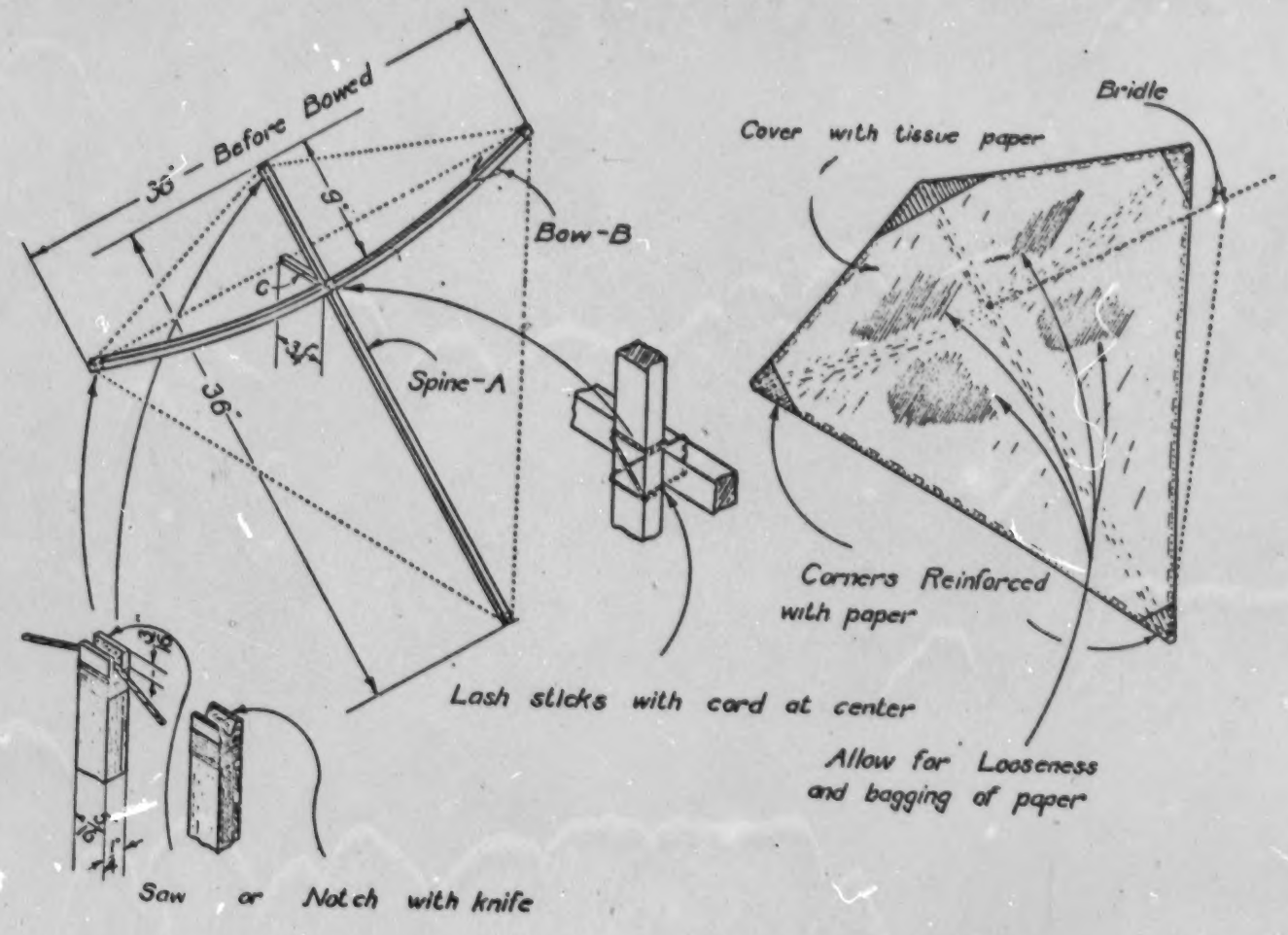




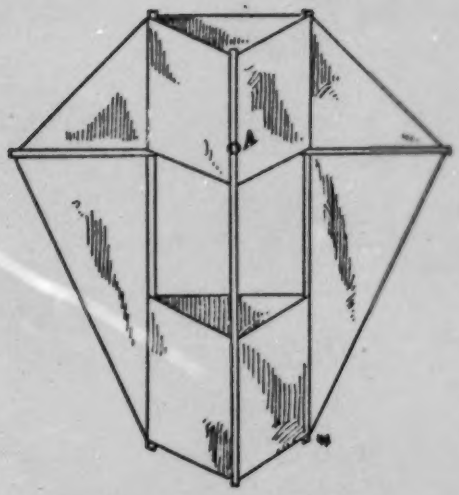
The Wings - A and - Cells - B can be covered with silk, cambric cloth or tissue paper.

Triangular Box Kite or
French War Kite

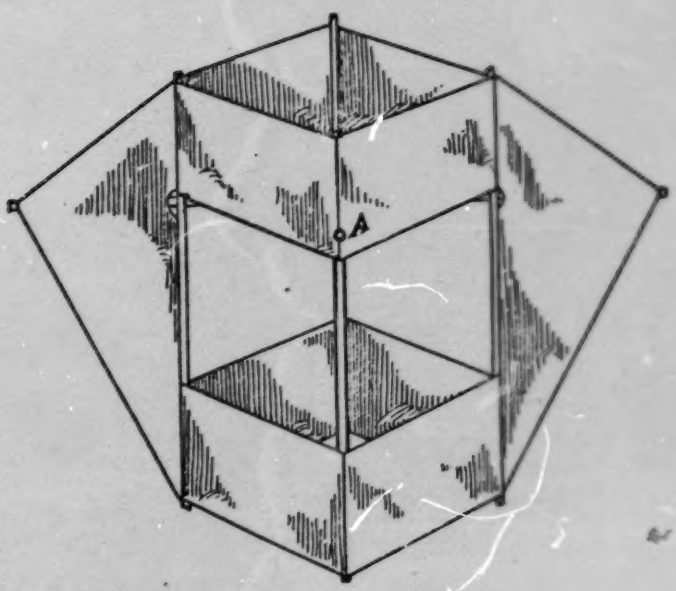
660



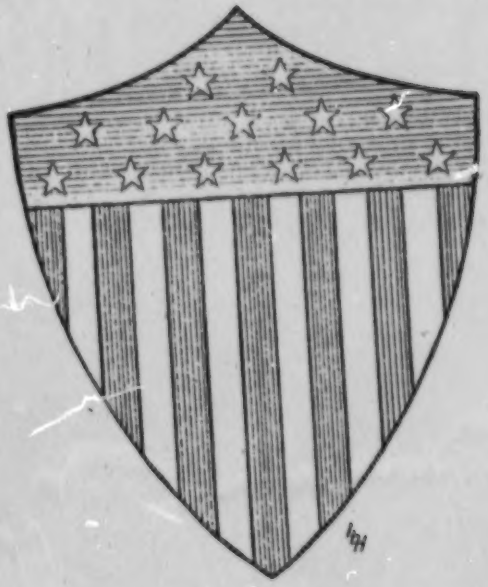
A Tailless Kite



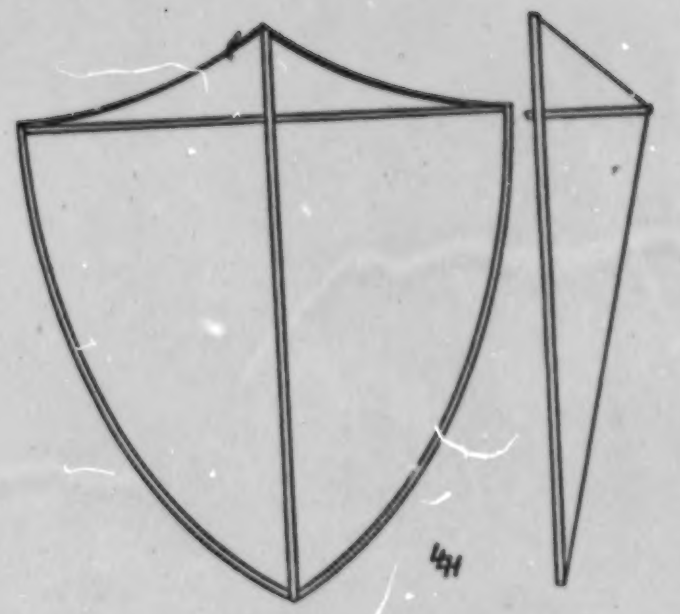
Triangular Box Kite with Wings



Square Box Kite with Wings



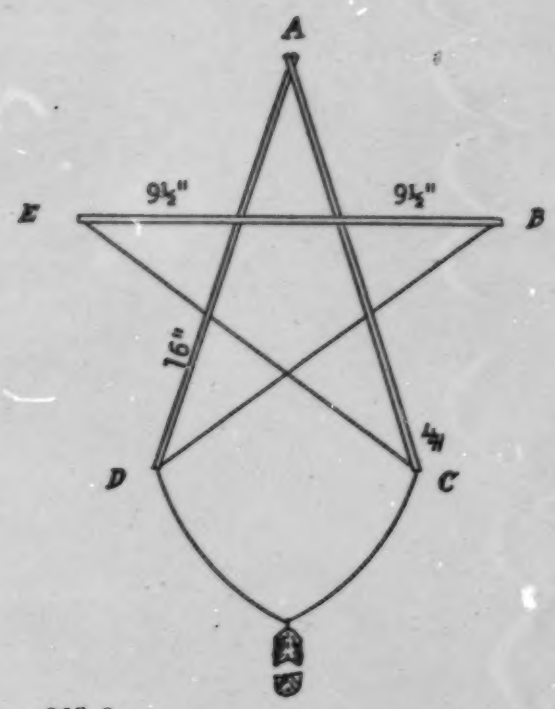
Front View of Completed Kite



Front view Edge View

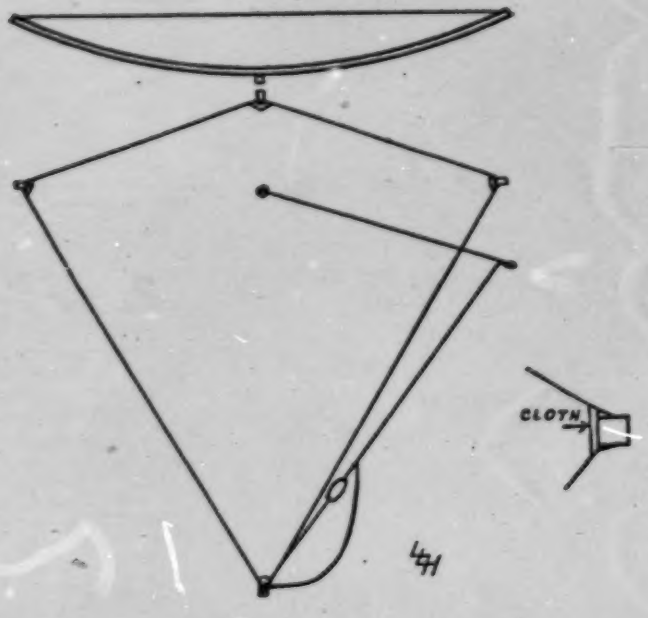
Frame

Shield Kite

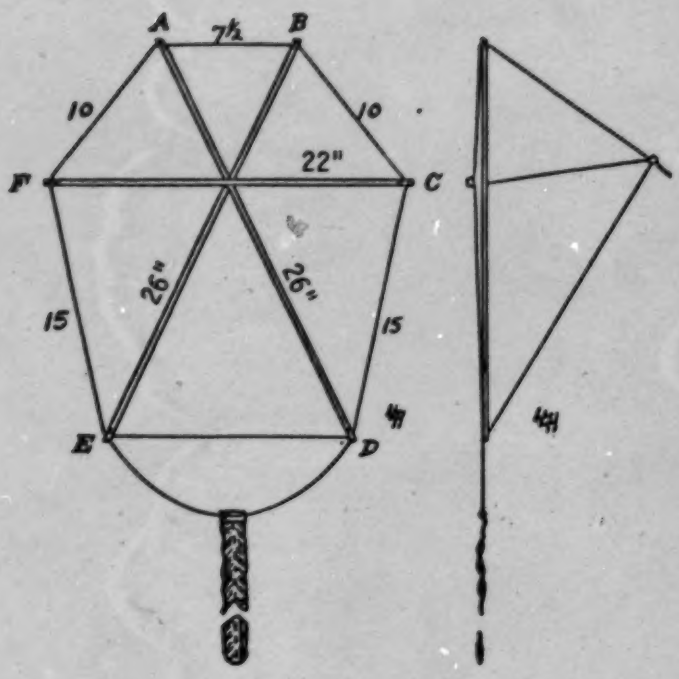


3 sticks - 26" long
Distance AB=BC=CD-DE=EA

Five-Point Star Kite



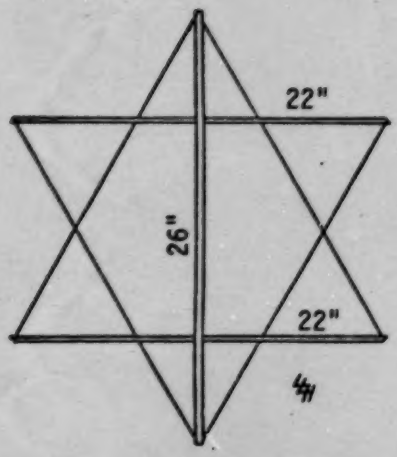
Bow Kite



Frame & Tail Attachment

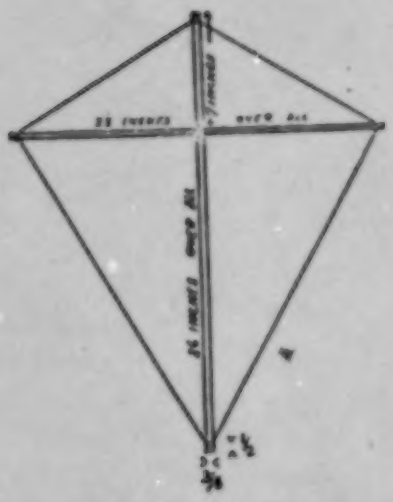
Edge View

Three Stick Kite



Frame

Six-Point Star Kite

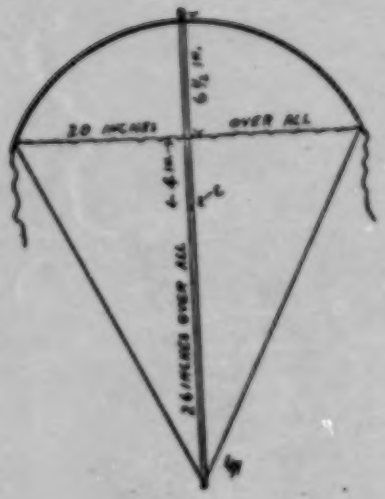


Frame

Front

Side

Two-Stick Kite



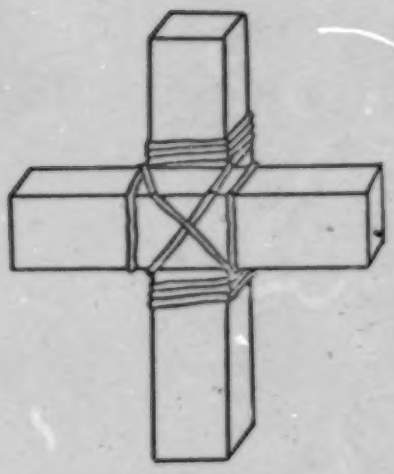
Frame

Front

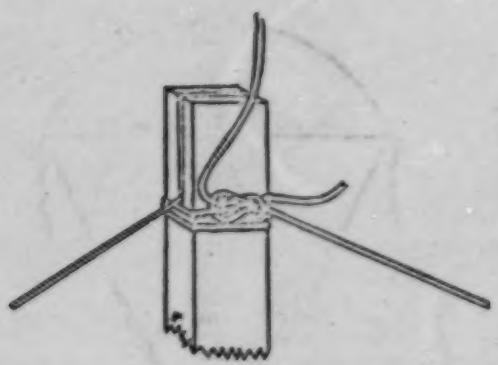
Side

English Kite

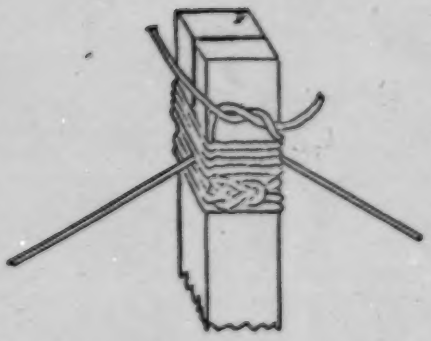
CONSTRUCTION TECHNIQUES (IDEAS)



Wrapping of sticks
where they cross



First Part



Finishing Wrapping

Wrapping End of Stick

Individualized Package on Kite Construction

Let's make a kite: Now that spring is here, so is the kite flying season. Instead of spending your allowance to buy a kite, you can follow the instructions in this lesson and make your own kite. You should even have fun doing it. When you are finished you can paint your name on it and fly it high in the sky. Good luck and have some fun.

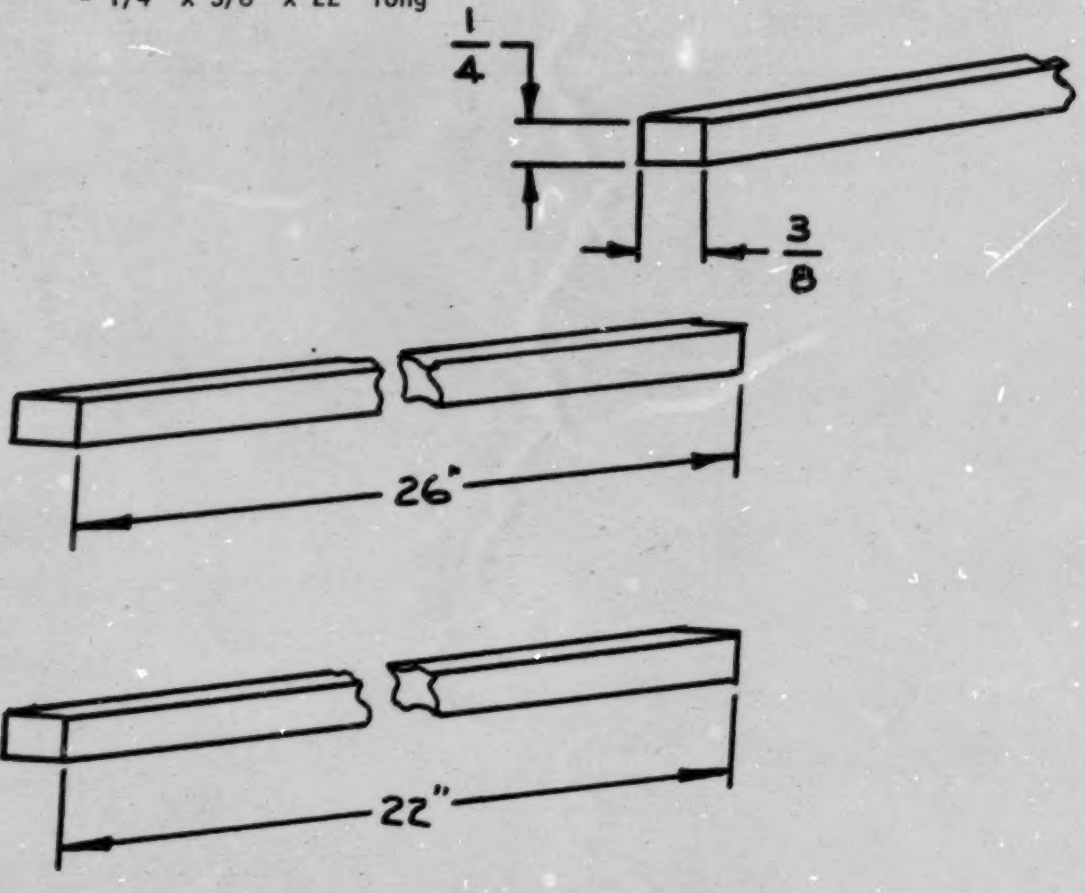
Materials:

1. Wood sticks - (pine or equivalent)
   1 - 1/4" x 3/8" x 26" long
   1 - 1/4" x 3/8" x 22" long
2. String
3. Glue (white or paste)
4. Covering - paper, newspaper, tissue paper, brown wrapping paper, etc.
5. Cloth strips or tissue paper

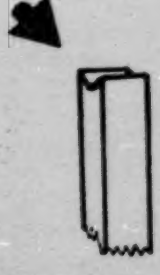
Tools:

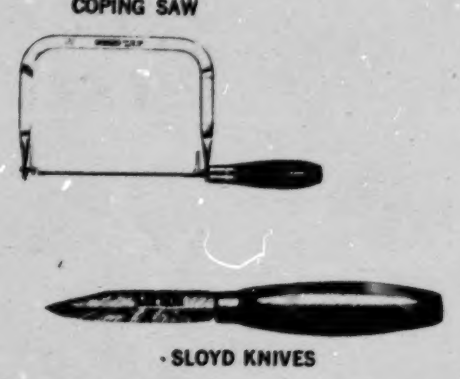
1. Power saw (if needed to cut wood sticks)
2. Saw - (coping or small hand saw)
3. Knife
4. Square (or square block of wood)
5. Rule - (wood or yardstick)
6. Scissors (or sharp knife and cutting table)

1. Obtain or cut two sticks
   - 1/4" x 3/8" x 26" long
   - 1/4" x 3/8" x 22" long

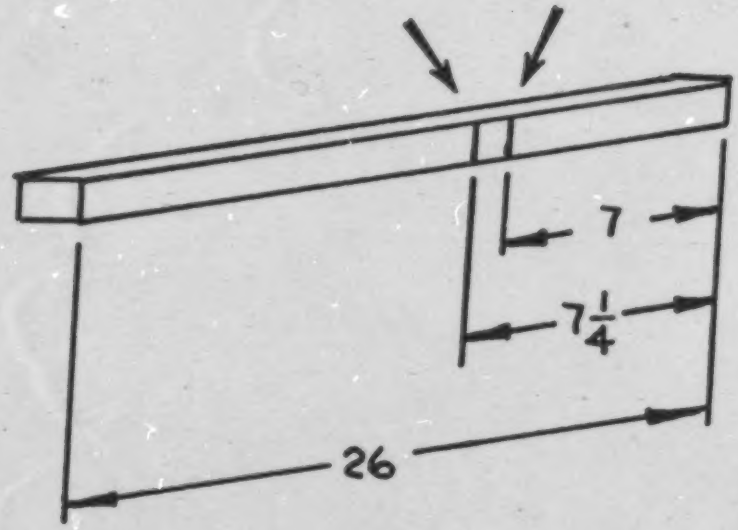


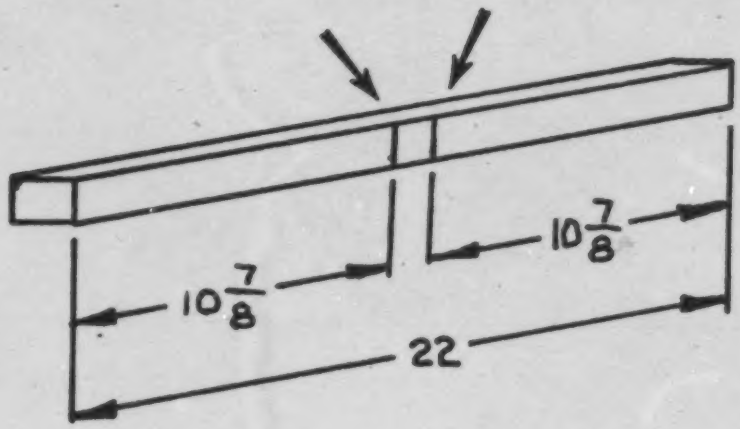
2. Notch ends with saw or knife.





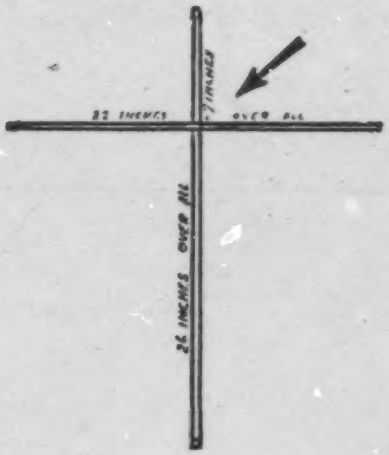
3. Mark sticks with a pencil in two places.





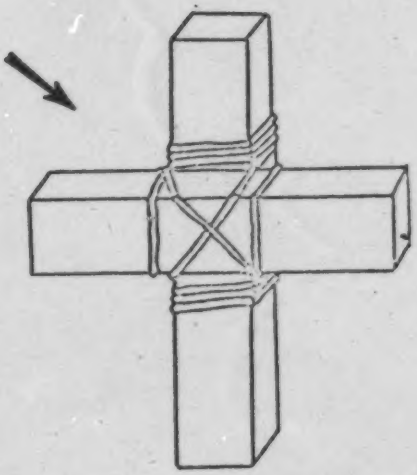
4. Obtain about twelve inches of string and tie the sticks together.

5. Line up marks.



It may be necessary to place shallow notches on the kite sticks to keep the strings from slipping.

6. Tie it like this.

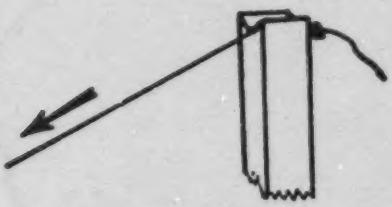


Using a ball of string:

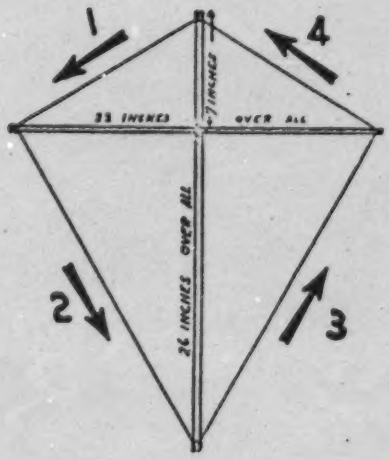
7. Lay kite frame on a table.

8. Tie a knot in one end of the string.

9. Lay knot in notch. It will catch when you pull on it.



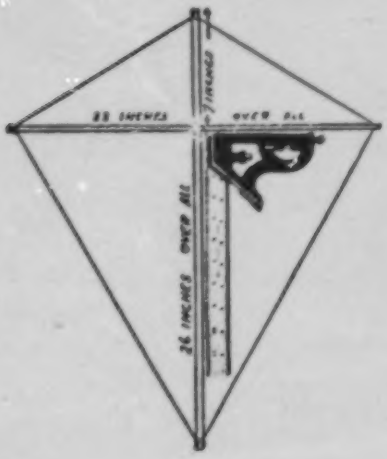
10. Wind the string around the frame. Put it in the notches.



11. Tie the two ends of the string together. Be sure string is <u>tight</u>.

12. Adjust the sticks at right angles.

    Use a block of wood or use a square.



13. Wrap ends with string.

14. Cut off all loose ends of strings.

15. Get the paper you are going to use to cover the kite.

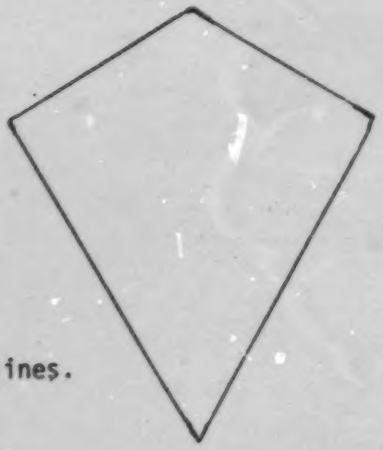
You can use: newspaper
crepe paper
plastic laundry bags
tissue paper

16. Place kite on top of paper (or covering).

17. Trace around string.

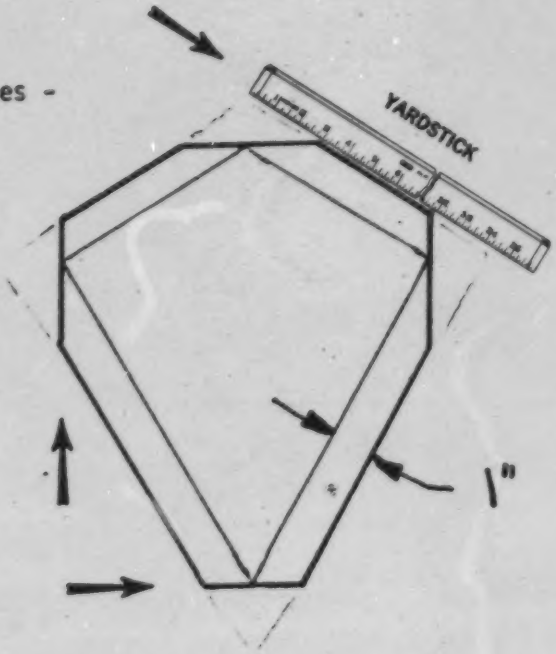
18. Remove kite frame

19. Pattern on paper should look like this ▶



20. Use a straight edge. Draw lines 1" outside of lines.

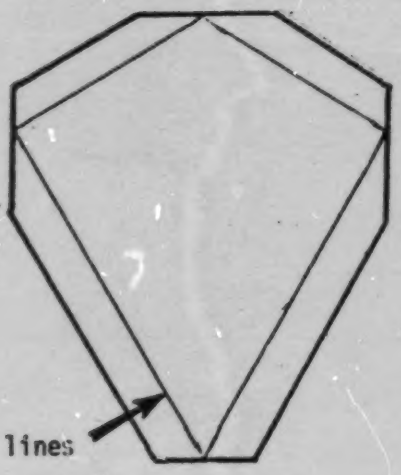
21. Draw four lines -



like this

22. Cut out pattern with scissors.

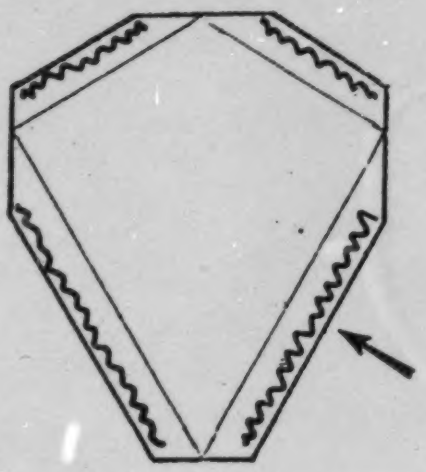
pattern



23. Fold pattern on inside lines
Then unfold again.

24. Obtain paste (or glue).

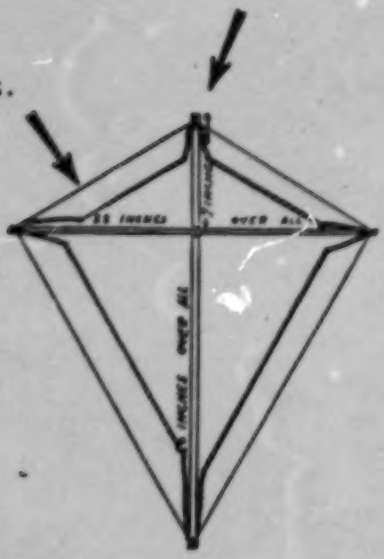
25. Apply paste 1/2" wide around <u>outside</u> of pattern.



26. Place kite frame on top of cover. Be sure <u>longest</u> stick is down.

27. Align kite frame so string is on the folds.

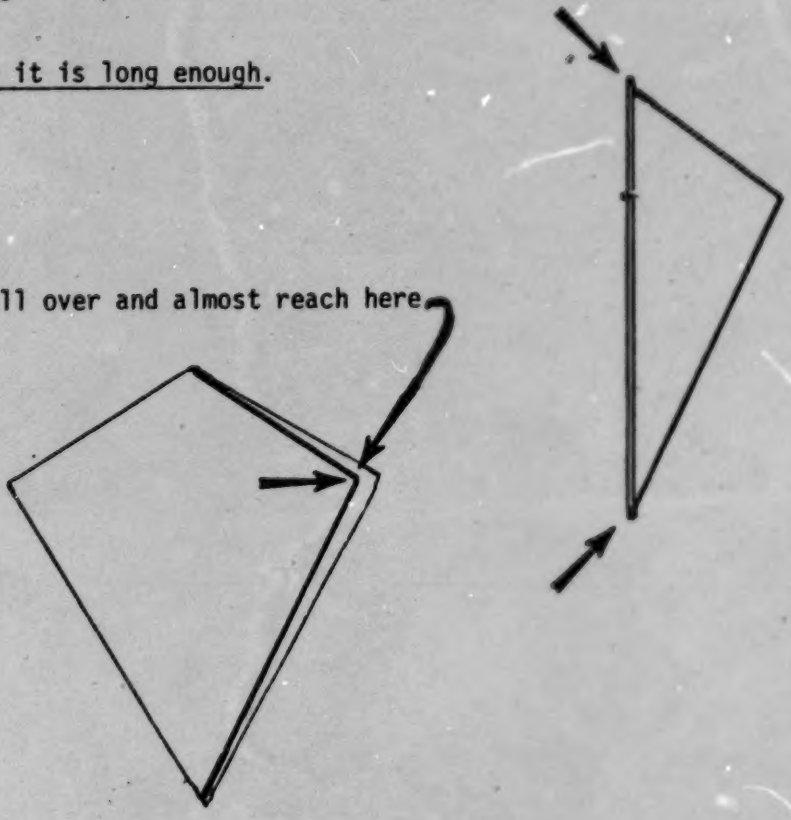
28. Fold cover over string. Smooth out.



29. Tie a string on top and bottom of long stick. This is called the bridle.

<u>Make sure it is long enough</u>.

It must pull over and almost reach here.

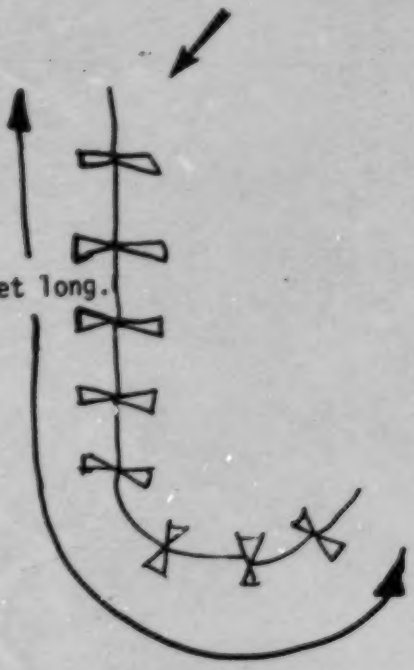


30. Construct a tail.

Use cloth strips - 1 1/2" wide and 1 foot or <u>more</u> long

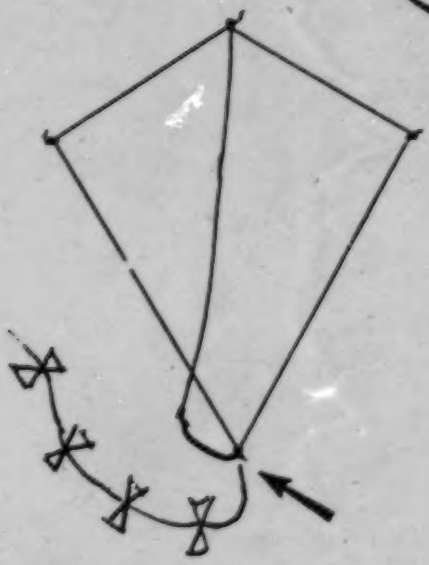
- tie together

- or, Use strips of paper tied to a string.



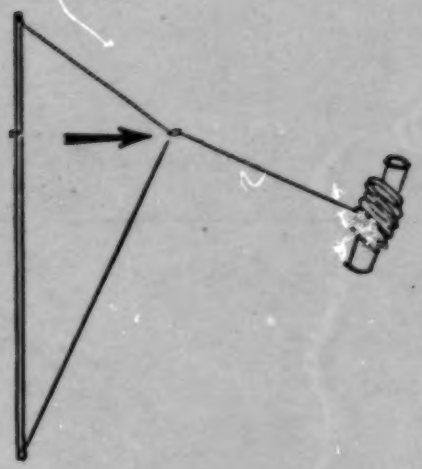
- Make tail 10 to 15 feet long.

31. Tie tail to bottom of kite.



32. Tie ball of string to bridle.

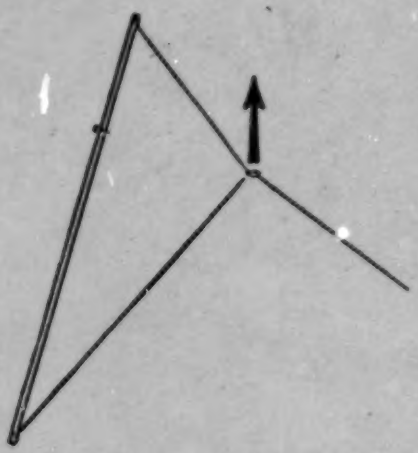
Tie in this position



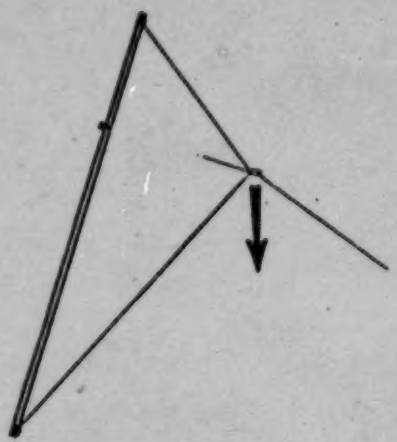
33. Test fly it!! Be sure there is a wind blowing!

Adjustments:

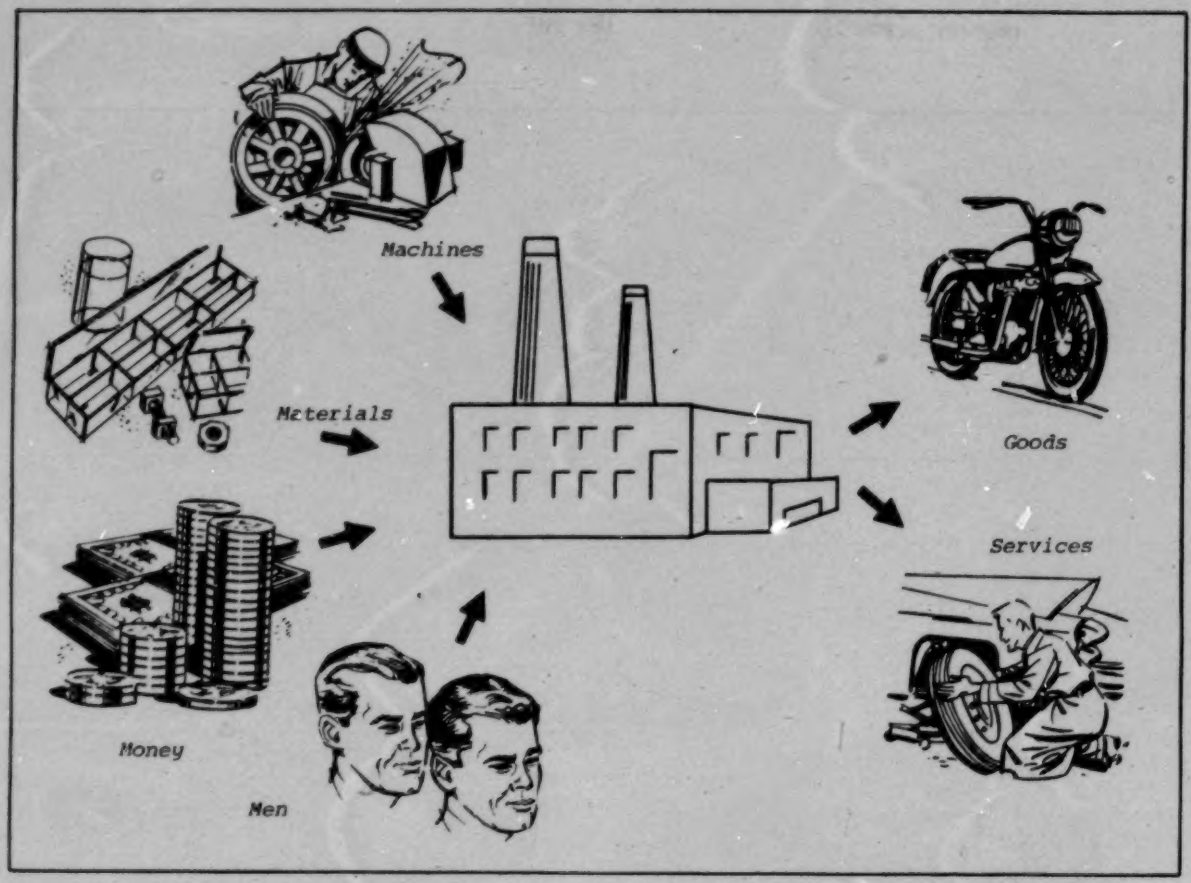
34. If it dives slide string up bridle.



If it drops, slide string down bridle.



EARLY LUMBERING



Prepared as an Aid in Implementing
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Improvement in Industrial Education, K-12

Learning Activity Package

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The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Materials

Early Lumbering

High School

Pertaining to Field Objective Number Three

"To explore the context in which
lumbering has developed."

Produced by

The Industrial Education Instructional
Materials Development Project
University of Wisconsin-Stout
Menomonie, Wisconsin

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Contributor to this Package:

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Supported by:

The Wisconsin Department of Public Instruction;
The Graduate College and the Center for Vocational,
Technical and Adult Education, both of the
University of Wisconsin-Stout

RATIONALE:

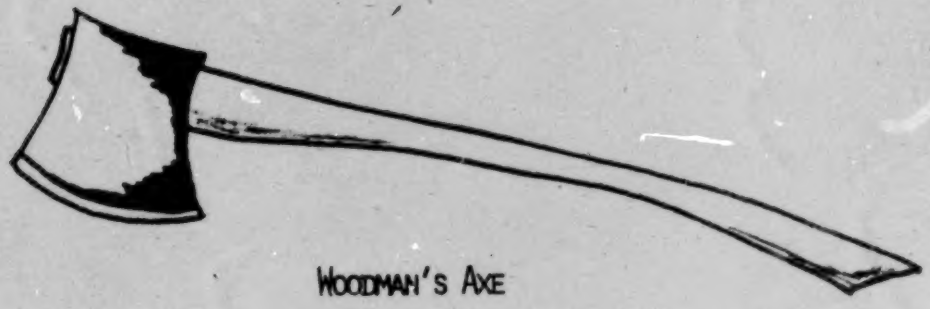
Why study the history of lumbering?

Currently the wood products field is one of the big areas of industry. From paper production to construction it is big business and here to stay. Recognizing that the wood industry plays in important part in our lives, it seems logical that we would want to know something about this area.

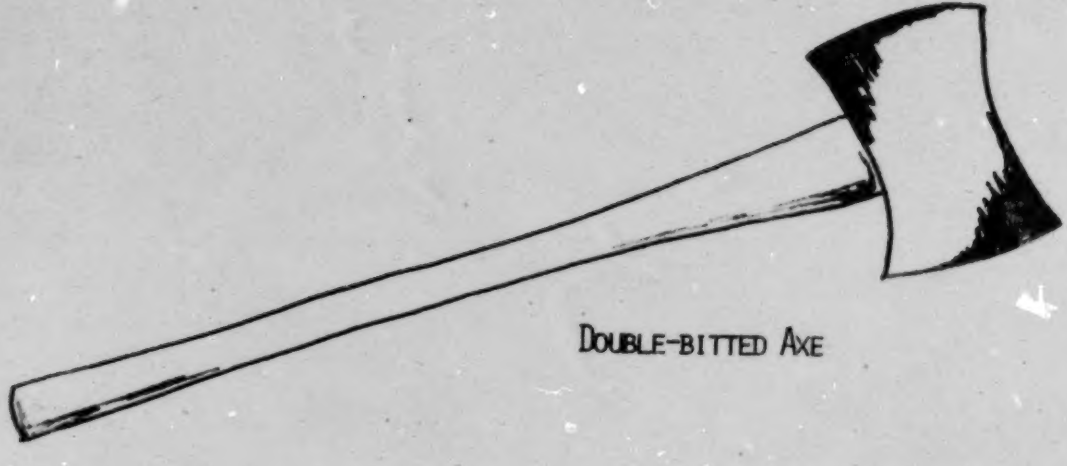
To really understand something you should start at the beginning, in the case of the wood products industry, it started with the lumberjack frontier. Together, with your previous knowledge and a viewing of the included illustrations and materials on the history of lumbering, it is hoped that you will develop a better understanding of today's wood products industry as well as gain some satisfaction in learning a little more of your own history. It is the purpose of this package to help you learn a little bit about the early lumbering era of the United States.

"TOOLS OF THE TRADE"

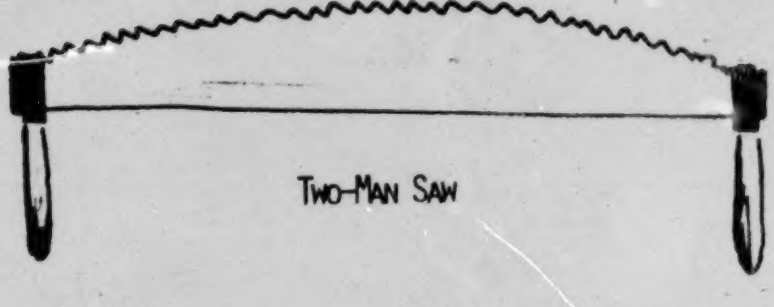
FROM THE EARLY LOGGING INDUSTRY



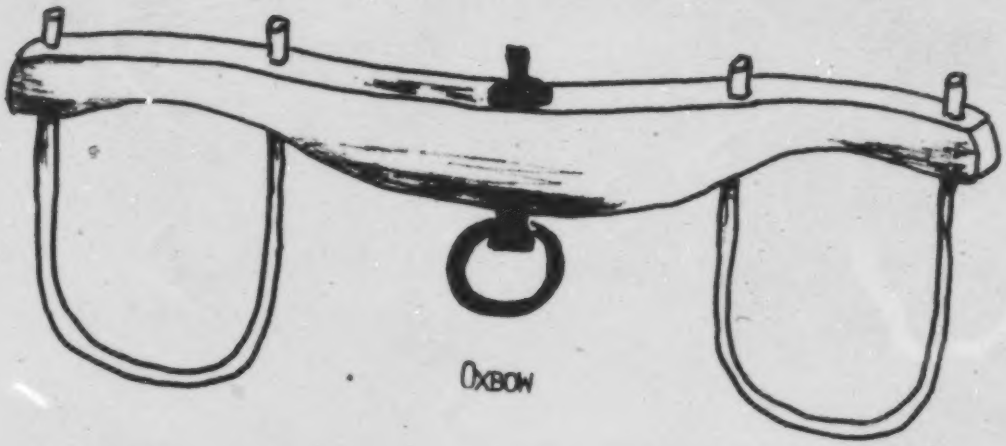
WOODMAN'S AXE



DOUBLE-BITTED AXE

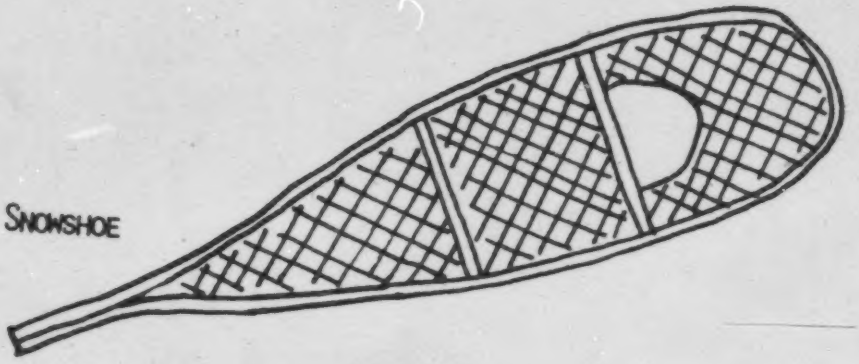


TWO-MAN SAW



OXBOW

HOOK



SNOWSHOE

OBJECTIVES

Terminal Objective:

To explore the context in which lumbering has developed.

Enabling Objectives: Upon completion of this package, you will be able to do the following things:

1. You will be able to identify the area and period of time covered by the early lumbering era.
2. You will know the difference between old lumbering techniques and current practice.
3. You will be able to identify five different jobs of the early lumbering era.
4. You will be able to recognize five different tools of the early lumbering era.
5. You will know what kind of trees were being logged during the early era and why.
6. You will recognize why the early lumbering era died.

Options: Read the self-test on the following pages and then check the following selections that apply to you.

___ If you feel you can meet the above objectives:

___ A. See the instructor for a teacher evaluation.

___ B. Take the self-test as a self evaluating device, then see your instructor.

___ If you feel you cannot meet the above objectives:

___ A. Take the self-test to see what objectives your studying should be based upon, then turn to the media section on page 7.

___ B. Skip the self-test and turn to the media section on page 7 to help you achieve the objectives.

Self-Test:

1. Early lumbering took place in what area of the United States?

2. The approximate dates of its existence were from _____ to _____ .

3. Name three methods of transportation used in the early days of lumbering.

   1.

   2.

   3.

4. List three methods of current transportation.

   1.

   2.

   3.

5. The _____ engine was not yet in use.

6. Five different jobs of the early lumbering era were:

   1.

   2.

   3.

   4.

   5.

7. Five different tools of the early lumbering era were:

   1.

   2.

   3.

   4.

   5.

8. The main trees being logged were _____.

9. The midwest lumber was shipped mainly to what region?

10. What was the primary reason the early lumbering era died?

MEDIA SECTION

Read pages 9-16 of this package or select optional media sources from the list below.

Books

Wyman, Walker D., The Lumberjack Frontier. University of Nebraska Press; Lincoln, 1969.

Holbrook, Steward H., Yankee Loggers. New York; International Paper Company, 1961.

Rector, William Gerald., Log Transportation in the Lake States Lumber Industry 1840-1918. Glendale, California; The Arthur H. Clark Company, 1953.

Fries, Robert F., Empire in Pine (the story of lumbering in Wisconsin 1830-1900). Madison, Wisconsin; The State Historical Society of Wisconsin, 1951.

Tapes, Slides, Movies, and Pictures

Russell, John, (Slides and tapes on the Menomonie area early logging era). 1973

Com-Tel T.V. (Half hour tape and slide presentation on the early logging days in the Menomonie area). 1973

Fears, J.C., (Early logging film). 1973

Russell, John, (Still life photos of early lumbering life). 1973

Stillwater Gazette, (Still life photos of early lumbering life). 1973

Historical Societies (Menomonie, Winona, and Stillwater). 1973

Personal Interview.

Russell, John, (Long talk about lumbering life in the Wisconsin area - John Russell is a local photographer who has spent the last six years researching the early logging days of Wisconsin and can be considered highly expert in this field). 1973

INFORMATION SECTION

The earliest of North American settlers were loggers, but not in the sense we are referring to here. That is, they were not professional men who lived solely by producing lumber. It took the industrial age, beginning about 1800, to bring on a big demand for lumber. By 1840 the early lumbering era had begun. The cutting down of trees and production of boards started in Maine and worked its way west as new trees were discovered and new men set out to seek their fortunes. Eventually the movement encompassed the whole northern United States. The transportation out of the woods was water - logs float and rivers flow. Actually not all logs will float, not long enough to float down long rivers anyhow. For this reason the conifers or evergreens (softwoods) were the trees that were logged off and floated out. Hardwood trees such as walnut and oak would become water ladden and sink, preventing their removal.

Most of the cutting was done in the winter with the logs being stock-piled on the river ice. When the ice thawed, the logs could be floated downstream closer to society and its demand for lumber. To start with, only the biggest trees were used, but eventually practically everything sawable was cut down, even small 1" trees which were split and used for barrel hoops. This complete removal of trees is called clear cutting and during the early era was practiced exclusively. Clear cutting was considered good in those days since the western movement was on and people were eager for farmland. Gradually the trees near the rivers ran out. Little creeks were dammed up and used to float out the logs by breaking the dams. But finally by about 1910 all the logs within easy horse hauling

distance of water (with the exception of the northwest United States) were gone. The end of the early logging era came as a result of a shortage of trees near water caused by clear cutting and resulted in a change of philosophy about cutting trees. The early logging era was over by 1910.

Basically early logging could be divided into two parts, cutting and driving. Cutting being done in the winter months and river driving during the summer. The trees were cut, trimmed, sawed into logs, pealed, skidded by oxen or horses to the roads, loaded on sleds, and hauled by oxen or horses to the river where they were usually piled on the ice until it thawed. The means of transportation consisted of oxen, horses, and floating on the rivers in the early logging days. Presently trucks, trains, and ships have taken their place. The tremendous manpower necessary for logging has been reduced mainly because of the gasoline engine which powers these forms of transportation and other types of power equipment.

From 1840 on, the logging industry grew and job specialties developed. The government owned most of the land and would give it to railroads to develop, homesteaders, or sell it to the lumbering men. Land was sold for about $1.25 an acre by the government and after the thousands of feet of lumber were sawed off the lumbermen would often let the land go back for taxes owed. Hundreds of different logging companies were in existence in the early logging days. Often jobbers' would contract with the lumber companies for a set price to cut off sections of land. 'Cruisers' walked thru the woods and estimated standing timber. Each owner had a 'woods boss', the man in over-all charge of logging for a company. Under

him was the 'walking boss', the foreman or superintendent in charge of two or more camps. Though he might use a horse or sleigh when operations were scattered, he often walked from camp to camp. The individual camp foreman was called the 'push'. Next important to the push in any camp was the 'cook', who rose at 3:00 a.m. and prepared three or four meals daily for up to one hundred men in a large camp. Beans, bread, salt pork, prunes, and pies were the stable diet with as many variations as a cook could develop. The 'cookee' was the cook's helper. The men worked from sunup to twilight. Up until 1880 they cut the trees with double-bitted axes, after that with crosscut saws. The 'sawyer' was the top worker, two men would use the crosscut-saw, one on each end, and a pair of sawyers would saw up to 100 trees a day. A 'swamper' was a man who brushed out the roads so the sawmen could get to their trees, and he made a trail for every tree that had to be skidded to the tote road (sled road for hauling logs to the river). The 'chain tender' barked off the tree, put a chain on the log, marked it with the company stamp, and helped get it on the go-devil. (The go-devil was a sledlike thing made out of the crotch of a hardwood tree looking like a chicken's wishbone.) A team of oxen or horses were hitched to it and could pull two or three logs at a time to the tote road. The 'skidder' operated the go-devil. At the tote road the logs were piled up to be loaded onto sleds. It kept a swamper and skidder busy following a pair of sawyers around all day. Skids of two long logs (70 to 80 feet) were used to roll the logs onto sleds. The logs were rolled on top of the skids onto the load. The sleds had sixteen foot bands for holding the logs. The loading crew was made up of three men. One man

was put on top of the load, the 'ski hooker', one man rolled the logs down the skidway to the sled, and the other man kept the log even as the team of oxen or horses pulled the log up on top. A 'hair pounder' or teamster drove each log sled down the logging road to the river. In big camps a special sled was constructed for hauling water to sprinkle the roads making them icey. Working as a flunky for the teamster driving the water tank was where new men often broke in. The lowest job in camp was the 'road monkey', he went along and shoveled the manure out of the ruts. If there were any lumps on the ice he chopped them out. Most camps had a 'blacksmith' and a 'wood butcher' who constructed the articles necessary to operate and repaired broken equipment. They worked together, often during the night.

An 'ink slinger' kept track of the time. Pay ranged from $20.00 to $40.00 per month depending on the job. Some of the men went down with the river drive, others went home to families and started clearing land, planting, and making 160 acres of stumps into a farm.

The men who went down the rivers in the spring drives were the 'white-water men' or 'river hogs'. They wore caulked boots, red mackinaws, and often walked on logs as they shot the rapids. Their main job was to get the logs from the woods down to the sawmills. The driving crew consisted of the 'drive boss', the 'cook', and the 'rivermen'. Water height in small streams was regulated by temporary dams. In these small streams the crew would break up with each group manning a ten mile or so section. Each man would go to the same spot every day and try to keep the logs moving. On larger rivers the crew and logs would go down the river together. 'Bateaus'

or small boats were used to maneuver logs and 'wanigans', larger boats, were used to carry food and supplies. At night a special 'wanigan' crew would have set up tents on shore for the rivermen to sleep in and the cook would keep food coming. When the logs got near to the sawmill where a permanent 'boom' site had been constructed the drive was over. At the boom site the logs were sorted by their stamps and sawed into lumber. From the sawmill large rafts of lumber were made up and riverboats were used to push them down river.

Many different terms and tools were unique to the early logging era and should be mentioned and defined.

WANGAN, WANIGAN, WANNIGAN - Has several spellings and refers to two wholly different things: (1) the camp commissary, or store, and the payroll charges for such goods; (2) the place where a crew of river drivers makes camp for the night. A large riverboat used for cooking and storage.

TOTE TEAM - Horses and wagon, or sled used to haul supplies or cars down steep inclines.

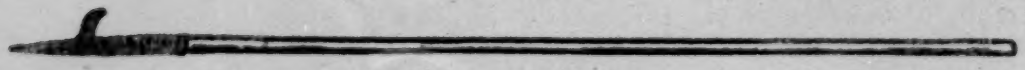
SNUBBER - A device for regulating the speed of loaded sleds or cars down steep inclines.

SLED - An apparatus with runners under it for hauling logs.

SKID ROAD - A road over which oxen or horses pulled logs.

PULP HOOK - A short metal hand tool used in handling small logs.

PIKE POLE - A long, slim wooden stick with a pike, or steel point, in one end. Used where logs are afloat in lakes or streams.



PEAVEY - The riverman's basic tool. Once described by a greenhorn as a "stick with a hook hanging on it." (same as CANT DOG.)

MUZZLE-LOADERS - Old-fashioned bunks into which one crawled over the foot of the bed.

LANDING - Place where the logs are assembled for laoding or for rolling into a lake or stream.

HOVEL - A barn to house logging animals.

HEADWORKS - A stationary windlass, operated by horse or steam power, used to pull booms of logs across sizeable bodies of water to the lake head.

HEAD DAM - A storage dam to hold water for driving purposes. Also called a SPLASH DAM.

HAY HILL - A steep place on a road on which hay or dirt has been scattered to act as a brake on sled runners.

GANG SAW - A sawing machine with heavy frame and a sash supporting several saw blades that work in unison. Makes several cuts simultaneously. Used extensively before the cicular saw was invented.

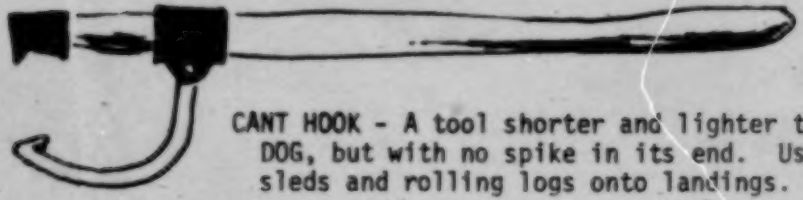
FELLING (OR FALLING) WEDGE - A long tapered wedge of steel, or wood, driven into the back cut to keep the saw free when making the final cut and to direct the fall of the tree.

DRIVE - The sending of logs down a river.

DEACON SEAT - The classic piece of bunkhouse furniture. Made of half a split log, flat side up. Runs from one end of the bunkhouse to the other.

CROSS-HAUL - To load a log on a sled by passing a line over and under, then pulling the line to roll the log up a set of skids.

CIRCULAR SAW - A thin steel disc with teeth on its periphery.



CANT HOOK - A tool shorter and lighter than a CANT DOG, but with no spike in its end. Used for loading sleds and rolling logs onto landings.

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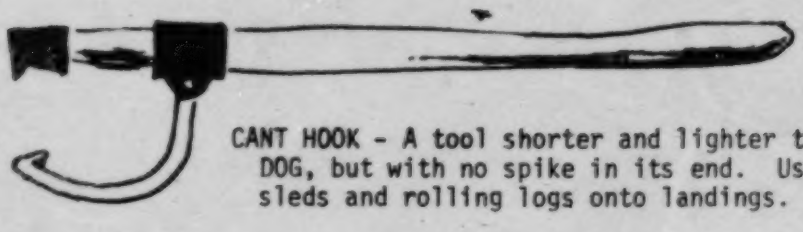

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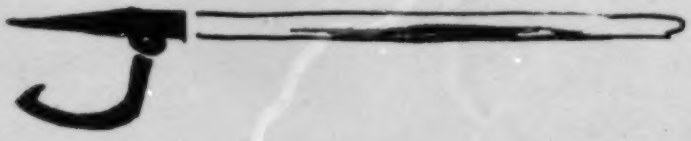


CALKS, CORKS - Short, sharp spikes set in the soles of shoes.

BULL CHAIN - The heavy endless chain at a sawmill used to haul logs from the pond up a curved chute to the deck of the head saw.

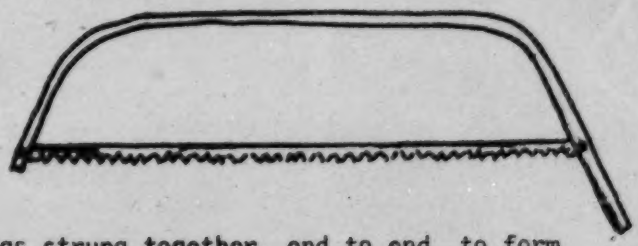
BUCK - To saw a tree into lengths after felling.

BROADAX - A wide-headed ax, beveled on one side only, for hewing ties and timbers.

BRIDLE CHAIN - Chain wrapped around a sled runner as a brake.

BRANDING-AX, BRANDING HAMMER - A tool for marking ownership of a log.

BOW SAW - A hand saw with the blade stretched between the ends of a bow-shaped steel frame.



BOOM - A sequence of logs strung together, end to end, to form a pocket for containing loose logs; or a string of boom sticks floating on the water to guide loose logs past an eddy, sand bar, or other obstruction, and eventually through a port called a SORTING GAP where they could be assembled according to size, species, and ownership.

BATEAU - The classic type of boat used on river drives.

The early lumbering era was caused by the large number of immigrants and the western movement. There was such a great demand for lumber by the country that a whole new industry was born. Waste was common, the hardwood trees were not even used unless they were easily available. Financial profits controlled

most decisions and the country was oriented towards clearing the woods for farming. The big coniferous trees - pines, sprice, and fir, provided most of the logs used during this rivering era. From the midwest region came the lumber that built towns, mines, and factories, on the Great Plains. This lumber was shipped by river and later by railroad as part of the 'west-ward expansion movement'.

There are many reasons that lumbering as it was done between 1840 and 1910 died. The main reason is simply that the trees ran out. Rivers could no longer provide the means of transportation to the market. Also new developments came along; steam and gasoline engines, railroads, trucks, better ships and boats, and steel and concrete construction, all of which changed the early lumbering industry. A new industry was born with a different philosophy. The radical idea of forestry management with 'sustained yield' was born and lumbering was on its way to becoming what it is today.

The early era cannot be considered bad, in terms of ruining the forests, it served a purpose in creating more farm-land and building a nation. Many large areas away from rivers were never clear-cut. Where the farmland failed, the trees are now growing back. With proper forestry management, the wood products industry should continue to fill its important role as a supplier of a replenishable natural resource - wood.

Activity: Materials (lumbering) - III - Terminal

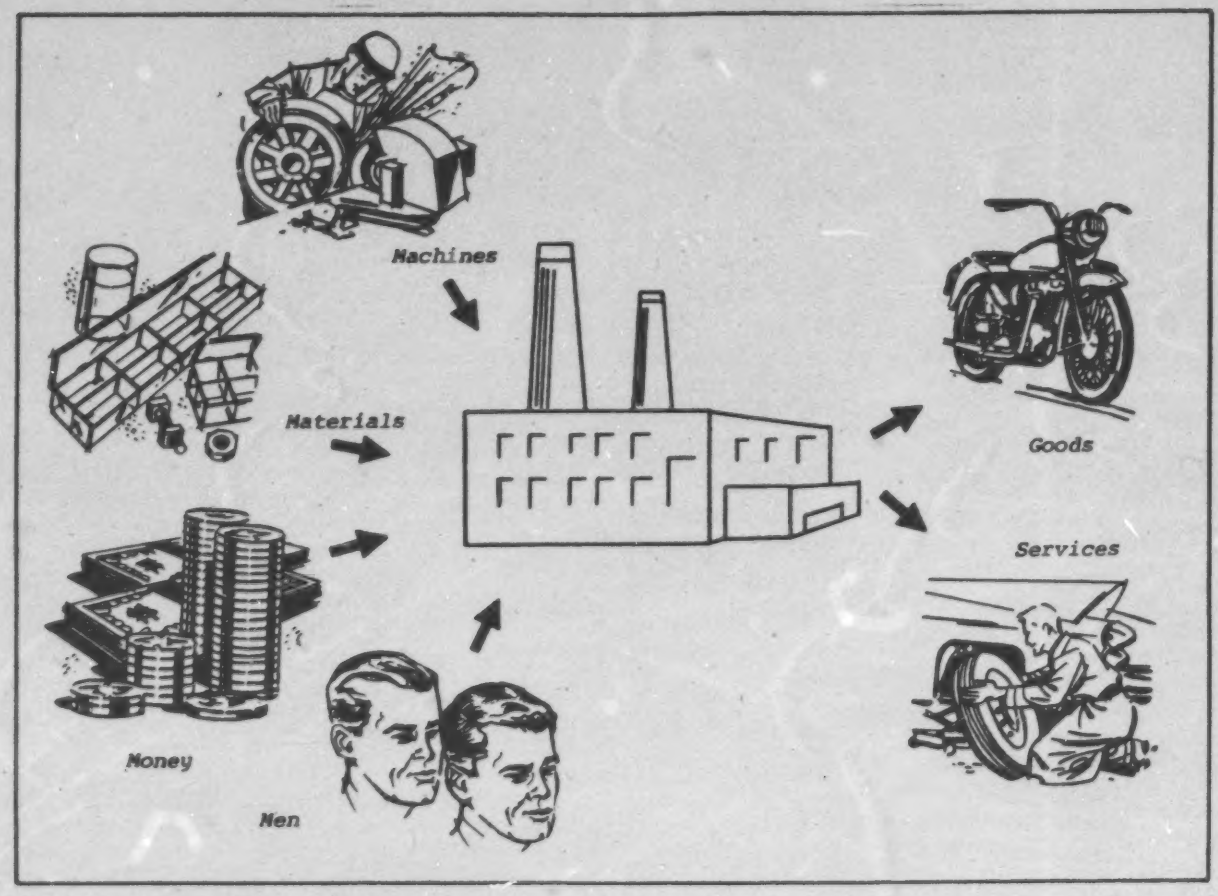
Teacher Directed
Group Projects

Problem: Using the information located in this package and other references, design and construct a model of an early lumbering camp.

Problem: Try to duplicate the methods used in this package to supply your shop with lumber.

REPAIR OF A LAMP CORD AND SOCKET

JUL 25 1975



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Improvement in Industrial Education, K-12

Activity Package

Prepared as an Aid in Implementing
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Improvement in Industrial Education, K-12

This package applies to the following industrial element:

Maintenance and Services

Repair of a Lamp Cord and Socket

Junior-Middle High School

Pertaining to Field Objective Number One

"To work with the element of industry
to gain an understanding of how they
function in producing goods and services"

Produced by

The Industrial Education Instructional
Materials Development Project
University of Wisconsin-Stout
Menomonie, Wisconsin

Project Director:

Lawrence S. Wright, Ed.D.

Assistant Director:

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John M. Ritz, M.S.

Contributor to this Package:

Thomas Burt

Supported by:

The Wisconsin Department of Public Instruction;
The Graduate College and the Center for Vocational,
Technical and Adult Education, both of the
University of Wisconsin-Stout

Repair of a Lamp Cord and Socket

Information:

In this package you will learn how to inspect and repair the electrical circuit of a lamp. The electrical circuit consists of four parts: the plug, the cord, the switch, and the socket. In most lamps the socket has a built in switch. In some the switch is separate. All parts must be working well for the lamp to be a safe, reliable source of light. A malfunctioning lamp is a serious hazard, and could be the cause of a fatal accident. Fortunately lamp repair is quite simple and inexpensive, so accidents can easily be avoided.

Tools and Equipment:

1. A table, floor, or wall lamp
2. A continuity tester
3. A screw driver
4. A wire stripper or a small knife

You may also need:

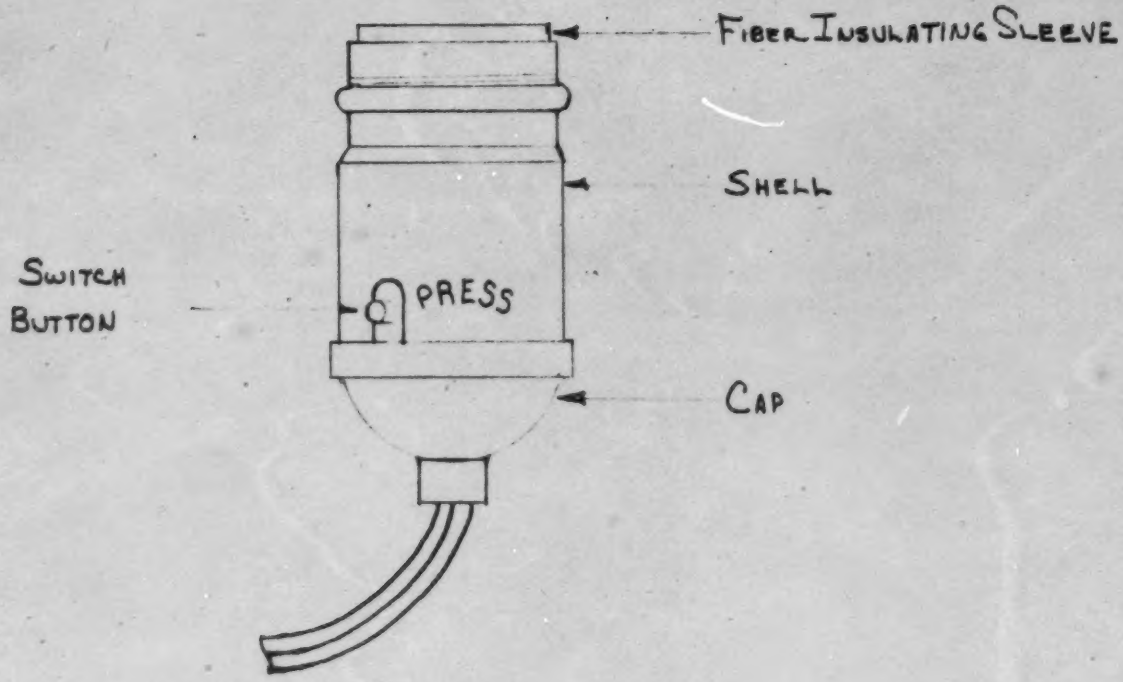
1. A new plug
2. #18 lamp cord
3. A new socket and/or switch
4. Resin core solder
5. Soldering iron

Procedure: You will inspect and repair, as necessary, each part of the lamp circuit.

1. Remove the cord from the lamp

   A. First remove the shade

   B. Depress the base of the socket - it is usually marked "press" and pull the shell of the socket from the cap.



C. Pull the shell from the cap far enough to allow you to disconnect the wires from the terminals.

2. Check for the following:

___ A. Is the fiber insulating sleeve charred?

___ B. Are the socket electrical contacts burned?

(Both A and B are signs of the use of too high a wattage bulb. Most small table lamps should have a 60-75 watt bulb maximum).

___ C. Is the porcelain or plastic base cracked or chipped?

___ D. Look at the general condition of the shell and cap. Do they fit together tightly?

___ E. Check the switch action. It should be positive and give sharp clicks when activated.

3. If the socket or socket-switch assembly fails any of the checks, replace the entire assembly.

4. If there is any sign of fault in a separate switch, replace it.

5. Inspect the plug and the cord:

A. Check for the following:

___ 1. Does the plug show any sign of damage? Does it fit snugly into the outlet and make good connection? (Bent plug terminals can usually be straightened.)

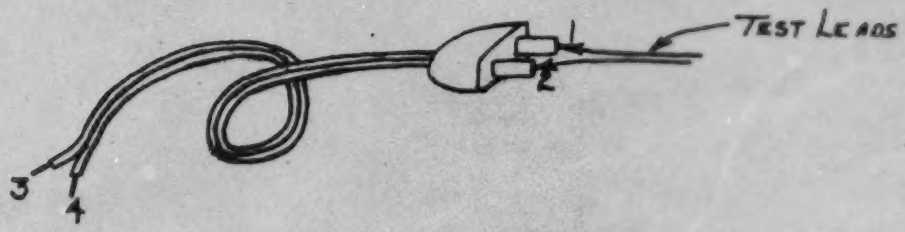
___ 2. Is the paper or plastic insulator cap between the terminals in place and in good condition?

___ 3. Does the cord show signs of deterioration such as fraying, splitting, or cracking of insulation?

___ 4. Are the plug wires properly attached to the plug terminals?

B. Test for continuity and shorts in the cord and the plug.

1. For continuity, connect the tester as shown:

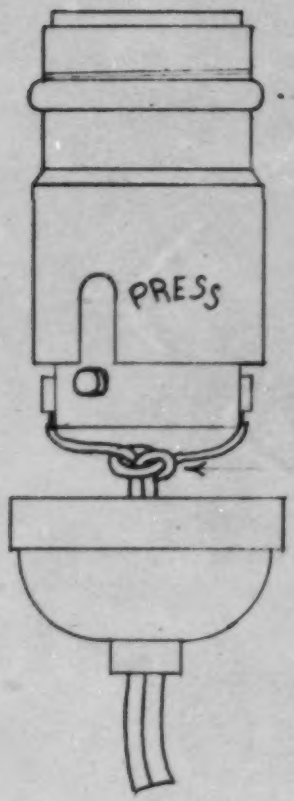


Then connect leads 3 and 4 on the cord. The light on the tester should illuminate. It should not blink when you move the cord around or twist the plug end.

2. For short circuit test, disconnect leads 3 and 4. Now the tester light should not illuminate.

C. If the cord or plug fails any of these checks, replace it. If you replace the cord, the standard cord length is 5 to 6 feet. Strip the cord ends about 1/2" and twist the exposed strands together. Then lightly tin the lead with solder. This will ease the attachment to the plug and socket terminals.

6. Reassemble the parts of the lamp, reversing the disassembly procedure. You should tie an "underwriters" knot between the cap and the shell of the socket to prevent the leads from being pulled from the terminals.



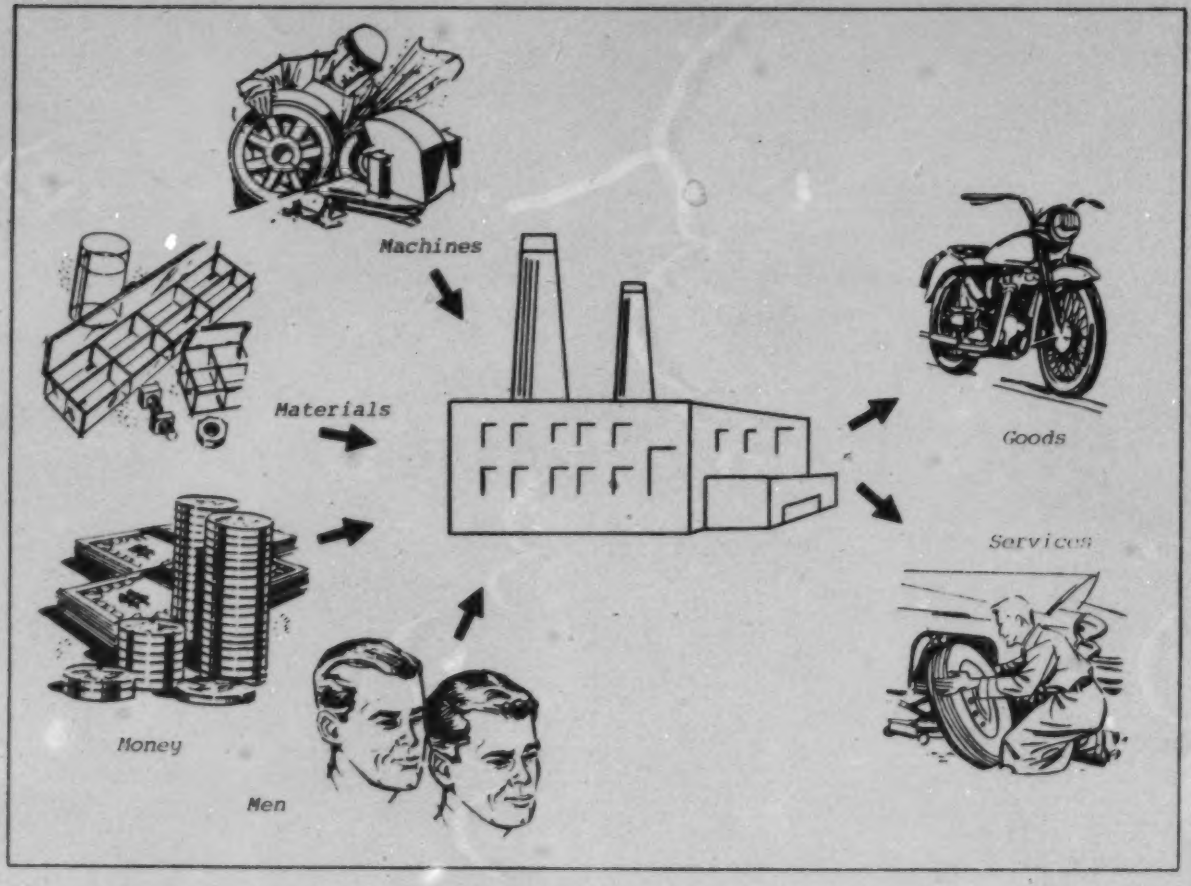
UNDERWRITER'S KNOT

HOW TO TIE KNOT:

7. Take the repaired lamp to your instructor for evaluation.

JUL 25 1975

THE DEVELOPMENT OF COMMUNICATIONS



Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Group Project Package

TEACHER DIRECTED

Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Communications

Junior-Middle High School

Pertaining to Field Objective Number Three

"To explore the context in which the communications industry has developed and continues to develop."

Produced by

The Industrial Education Instructional
Materials Development Project
University of Wisconsin-Stout
Menomonie, Wisconsin

Project Director:

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Teacher Preparation:

Class 1 - Introduce unit, describe what is going to be done. Use the rationale and objective page.
Show movie - one of the following:

Communication, 10 min., B&W, 1961,
Gateway Productions, Inc.
1859 Powell Street
San Francisco, California 94111

Communications - Story of its Development, 11 min., color
Coronet Films
65 E. South Water Street
Coronet Building
Chicago, Illinois

Communication - Twentieth Century, 11 min., color
Douglass Productions
P.O. Box 878
Sedona, Arizona. 86336

Hand out student assignment and era sheets.

Class 2 - Describe various eras using the era information sheets
- Have students choose era groups
- Have students select particular sub-division each would like to research.

3 Week Period - Student independent research.
- Student will research area, write report and construct replica models

7 days - Era presentations by student era groups

1 or 2 days - Set-up museum display and teacher overview

RATIONALE:

The purpose of this lesson is to further develop the student's concept of the area of communications. By tracing communications from the ways they began with the early caveman to the present, the student will have the opportunity to explore the context in which the communications industry developed and the way it is continuing to develop.

OBJECTIVES:

Terminal Student Objective:

To explore the context in which the communications industry has developed and continues to develop.

Enabling Objectives:

The student will list either orally or in writing the seven eras of communication development presented in this lesson.

The student will list and describe either orally or in writing the developments which occurred in any one particular era of communication.

Given the necessary information and equipment, the student will design plans for the production of replica examples of developments in communications.

Using self designed plans for the production of a product related to a particular era in the development of communications, the student will construct the product, and prepare a written report describing the product.

Terminal Material Product:

The final product of this instruction is the development of a museum containing replica examples of communications throughout history with labels indicating what the developments were and when they took place.

ERAS OF COMMUNICATIONS TO BE STUDIED:

I. The Way Communications Began

- A. Early Cave Drawings
- B. Later Cave Drawings
- C. Picture Writing
- D. The Alphabets
- E. Talking

II. Messages of Early Times

- A. Fire Signals
- B. Beacon Lights
- C. Megaphone
- D. Drums and Horns
- E. Bells
- F. Whistles
- G. Flags
- H. Messengers (Runners, Riders, and Pigeons)

III. Stones to Books

- A. Stone, Clay and Wax Writings
- B. Papyrus, Parchment and Paper
- C. Pens, Ink and Pencils
- D. Books
- E. Block Printing
- F. Printing Press
- G. Maps

IV. Early American Communications: Letters, Mail and Newspapers

V. Early Inventions

- A. Telegraph
- B. Cable
- C. Telephone
- D. Wireless
- E. Camera
- F. Typewriter

VI. Recent Communication Inventions

- A. Movies
- B. Phonograph
- C. Television
- D. Recorders

VII. Present and Future Inventions

- A. Stereo
- B. Computers
- C. Satellites
- D. New Up-Coming Inventions

Overall Assignment Sheet for Students:

The purpose of this instruction is to explore the context in which the communications industry has developed and continues to develop.

Things to be Done:

1. After the introduction by the teacher, select an era in the development of the field of communications you would be interested in studying. If the eras are not well covered by the student population, the teacher may further direct era coverage.

2. Divide into era groups and discuss the sub-divisions located within each era. Select a particular sub-division within an era to research. Each student will have a sub-division. All sub-divisions within the era should be covered.

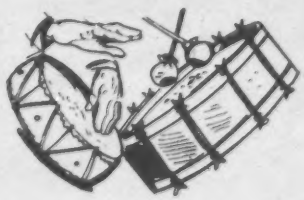
3. During class periods and free time, proceed to the library and read articles in encyclopedias and books to find out as much information as possible on your area of study. You may wish to use the card catalogue in the library to find books on your research area.

4. Prepare a written report on your selected area of study.

5. Develop plans and produce a product which will represent your selected area of study within an era.

6. Members of each era group will conduct a presentation of their studies to the class.

7. All class members will help in preparing a museum of the history of communications. This museum will include the products produced by the class. All products will be labeled and dates included.



Era I - Information Sheet

Topics - "The Way Communication Began"

A. Early Cave Drawings
B. Later Cave Drawings
C. Picture Writing
D. Alphabet
E. Talking

References:

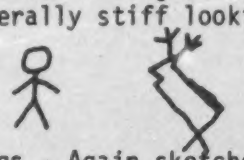
1. Encyclopedias under following topics:

   A. Communications - History of . . .
   B. Writing Development
   C. Man
   D. Language
   E. Paleolithic
   F. Alphabet
   G. Others listed in encyclopedias under these topics

2. Books - check card catalogue under communications

Possible Activities:

A. Early Cave Drawings - Here you may wish to sketch some samples of early cave drawings. Remember that the early drawings were generally stiff looking, two legged animals without color.



B. Later Cave Drawings - Again sketches would be appropriate to show this form of early communication. The animals and symbols of this period were more structured and contained color.

C. Picture Writing - Here the symbols were put together and told of stories or happenings. The American Indians often used this form of communication. An example would be the following:

Translated: Many hunters traveled by river in canoes for two days and two nights and hunted deer and buffalo in the forest.

D. Alphabet - A possibility for this development is looking in encyclopedias and tracing the development of a language from past to present, listing origins and dates. Example:

Tyrian 900 B.C.	𐤀	𐤁	𐤂	𐤃	𐤄	𐤅	𐤆	𐤇
Early Greek 750 B.C.	Α	Β	Γ	Δ	Ε	Ϝ	Ζ	Η
Later Greek 400 B.C.	Α	Β	Γ	Δ	Ε	Ϝ	Ζ	Η
Roman 300 B.C.	A	B	C	D	E	F	Z	H
Russian Today	А	Б	В	Г	Д	Е	Ж	З

E. Talking - Here a written script could be developed or a tape made of how early sounds developed.

Ask your instructor for other suggestions on model development.

Overall Directions: This group should make a small sign labeling the era of study and also small labels of the periods of study within their era including approximate dates of these developments.

Era II - Information Sheet

Topics - "Messages of Early Times"

A. Fire Signals
B. Beacon Lights
C. Megaphone
D. Drums and Horns
E. Bells
F. Whistles
G. Flags
H. Messengers (runners, riders and pigeons)

References:

1. Encyclopedias under following topics:

   A. Communication - History of . . .
   B. Signals
   C. Light Houses
   D. Megaphone
   E. Drums, History of . . .
   F. Horns
   G. Bells
   H. Whistles
   I. Messengers
   J. Pony Express
   K. Pigeons, Carrier
   L. Related Topics included in encyclopedias

2. Books - check card catalogue on topics.

Possible Activities:

A. Fire Signals - could sketch drawings of fire signals used by cavemen and Indians (smoke signals or flaming arrows) or later developed fire signals where men used torches that they raise from behind walls.

B. Beacon Lights - Here you could research the history of the light house and sketch drawings of its development or construct a model of one type of light house out of wood or clay.

C. Megaphone - Probably the best project to show the megaphone would be to construct a paper or cardboard model. Also pictures could be collected or sketches made of early to later development and use.

D. Drums and Horns - Models of drums and horns could be constructed or pictures collected.

E. Bells - Stories can be gathered of how they were used throughout history. Pictures or samples may be collected.

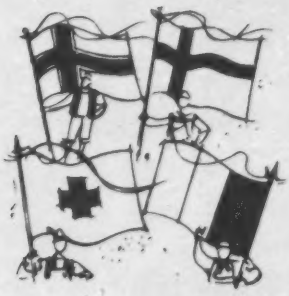
F. Whistles - Samples may be collected or pictures and sketches made.

G. Flags - The best example would be to obtain or construct a set of signal flags.

H. Messengers (runners, riders and pigeons) - Here it would be easy to collect pictures and list dates of how these systems developed and were used.

Ask your instructor for other suggestions on model development.

Overall Directions: This group should make a small sign labeling the era of study and also other labels of the periods of development within the era, including approximate dates of developments.



Era III - Information Sheet

Topics - "Stones to Books"

A. Stone, clay and wax writings
B. Paper - how it developed
C. Ink, pens and pencils
D. Books
E. Block Printing
F. Printing Press
G. Maps

References:

1. Encyclopedias under the following topics:

A. Communications
B. Writings
C. Paper
D. Papyrus
E. Parchment
F. Ink
G. Pens
H. Pencils
I. Books
J. Printing
K. Gutenberg
L. Maps

2. Books - check card catalogue on communications and topics listed above.

Possible Activities:

A. Stone, clay and wax writings - samples should be made of each of the following. Stone - story scratched on slate using picture language. Clay - a clay tablet should be constructed containing a story. Wax - wax tablet should be made also including a short story.

B. Paper - Check in a graphics arts book to obtain directions for making paper. Also, samples of different papers could be collected.

C. Ink, pens and pencils - Gather a collection of bottled ink, different types of pens and different types of pencils. Label all and include dates when used.

D. Books - Write a story about their development and collect some samples for display.

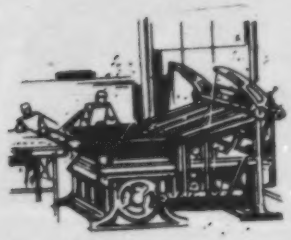
E. Block Printing - Check in a graphic arts book for directions to carve a lineolum block.

F. Printing Press - Write article about development and collect some pictures.

G. Maps - Story, samples and sketches should be gathered.

Ask your instructor for other suggestions on model development.

Overall Directions: This group should make a small sign labeling the era of study and also other labels of the periods of development within the era including approximate dates of the developments.



Era IV - Information Sheet

Topics - "Communication in Early America"

A. Letters
B. Mail
C. Newspapers

References:

1. Encyclopedias on following topics:
   A. Communications
   B. Mail
   C. Newspapers

2. Books - check the card catalogue on the above topics.

Possible Activities:

A. Letters - Prepare a short story with sketches of how letters started and developed into the American Mail system.

B. Mail - Story of how it started and continues to grow

C. Newspapers - Story and samples

Ask your instructor for other suggestions on model development.

Overall Directions: This group should make a small sign labeling the era of study and also other labels of the periods of development within the era including approximate dates of development.

Era V - Information Sheet

Topics - "Early Inventions"

A. Telegraph
B. Cable
C. Wireless Radio
D. Camera
E. Typewriter

References:

1. Encyclopedias on the following topics:
   A. Telegraph
   B. Cable
   C. Wireless
   D. Radio
   E. Camera
   F. Typewriter
   G. Communications

2. Books - check the card catalogue on the above topics.

Possible Activities:

A. Telegraph - Construct a telegraph set using the illustrations from your references.

B. Cable - Collect pictures and write a story describing the cable.

C. Wireless Radio - Construct a wireless radio using reference information.

D. Camera - Collect pictures and write a story pertaining to the development of the camera and photography.

E. Typewriter - Collect drawings or pictures of the development of the typewriter.

Ask your instructor for other suggestions on model development.

Overall Directions: This group should make a small sign labeling the era of study and also other labels of the periods of development within the era including approximate dates of developments.

Era VI - Information Sheet

Topics: "Recent Inventions"

A. Movies
B. Phonograph
C. Television
D. Records

Refererces:

1. Encyclopedias on the following topics:

   A. Communications
   B. Movies
   C. Phonograph
   D. Television
   E. Records

2. Books - check the card catalogue on the above topics.

Possible Activities:

A. Movies - Collect samples of movie films and write a brief description of how movies developed through the decades.

B. Phonograph - Obtain a sketch or picture of the early phonograph and write a story describing its development.

C. Television - Gather pictures or drawings describing the early T.V. and later developments excluding the color T.V.

D. Records - Obtain samples of the different kinds of records developed and a short story describing how they were and are manufactured.

Ask your instructor for other suggestions on model development.

Overall Directions: This group should make a small sign labeling the era of study and also other labels of the periods of development within the era including approximate dates of development.

Era VII - Information Sheet

Topics: "Present and Future Inventions"

A. Stereo
B. Computers
C. Satellites
D. Color T.V.
E. Other present and future inventions

References:

1. Encyclopedias on the following topics:

   A. Communications
   B. Stereo
   C. Computers
   D. Satellites
   E. Color T.V.

2. Books - check the card catalogue on the above topics.

Possible Activities:

A. Stereo - The student could visit a stereo shop and collect several packets of literature (including pictures) on recent developments in stereos. A short story should describe the stereo.

B. Computers - Collect pictures and prepare a short story describing the development of the computer.

C. Satellites - Gather pictures showing some of the different types of satellites. Or obtain a plastic model of the satellite. Prepare a story describing how satellites are used in transcontinental communications.

D. Color T.V. - Obtain pictures of new and future T.V.'s and write a short story explaining the color T.V.

E. Other inventions - This area is open for future expansions in the communication area. Scientific magazines will help to research this area.

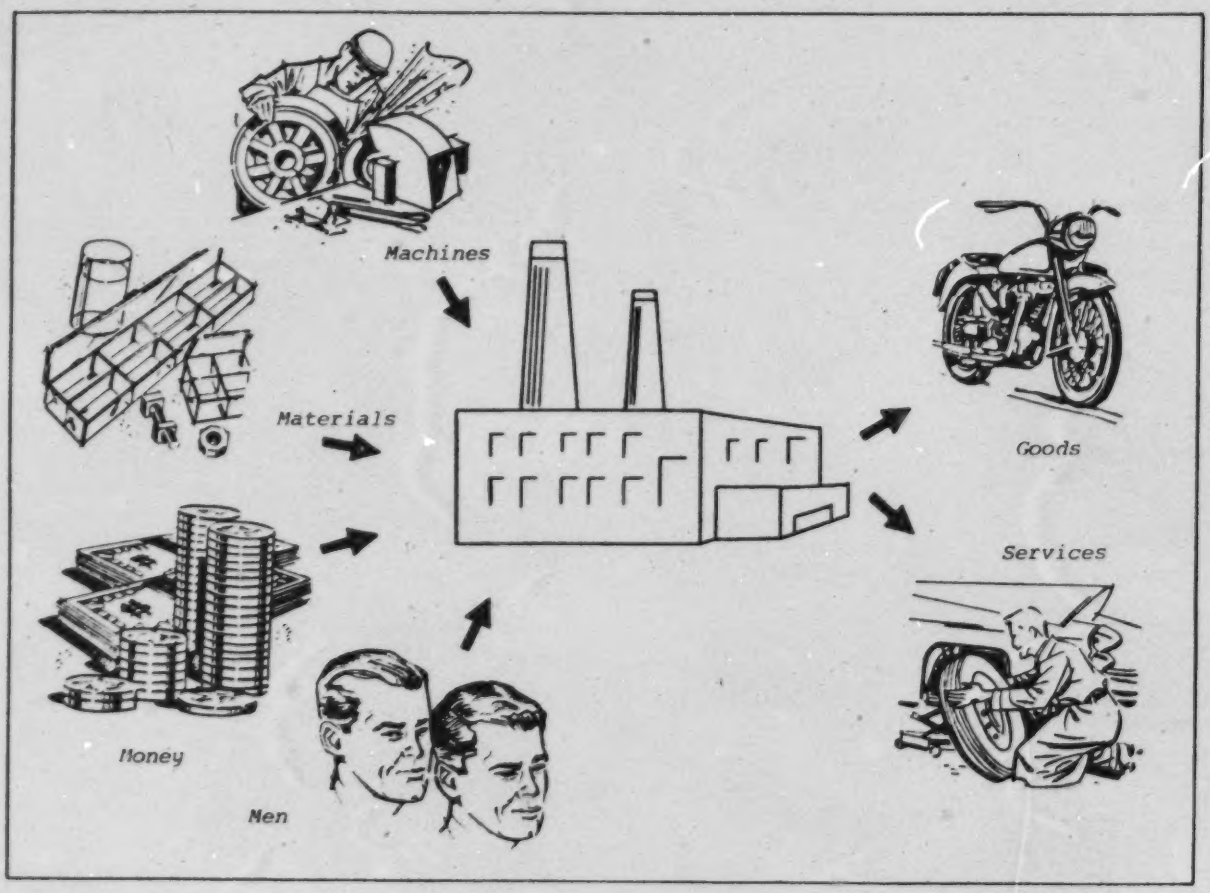
Ask your instructor for other suggestions on model development.

Overall directions: This group should make a small sign labeling the era of study and also other labels of the periods of development within the era including approximate dates of development.

AN AUDIO-VISUAL PRESENTATION

JUL 25 1975

THE DEVELOPMENT OF COMMUNICATIONS



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Audio Visual Presentation

Prepared as an aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education K-12

This script should accompany the
film strip and cassette presentation entitled:

THE DEVELOPMENT OF COMMUNICATIONS

Pertaining to Field Objective Number Three

"To explore the content in which industry has developed and continues to develop."

Produced by:

George Oles

in cooperation with

Instructional Technology Services

and

The Industrial Education Instructional
Materials Development Project

Both of the University of Wisconsin--Stout
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Project Director:

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THE DEVELOPMENT OF COMMUNICATIONS

Slide #1 The Development of Communications

Slide #2 The Solar System

Slide #3 The earth from moon

Slide #4 Ice bergs

Millions of years ago, molten rock

Slide #5 wind, and sea pounded against each other to prepare mother earth for her most amazing house guest

Slide #6 man.

Slide #7 What was it that enabled this two legged creature to rule over the earth and her inhabitants?

Slide #8 Why is man the supreme being on earth?

Slide #9 The answer is communications!

Slide #10 Man first evolved on much the same order with the other animals, and soon found the elements too strong an enemy for one man to handle alone.

Slide #11 Unlike the other animals who hunted for themselves, men banded together and worked for the survival of the group.

Slide #12 A great deal of what we know about our ancestors is found on the walls of caves--in the form of prehistoric drawings.

Slide #13 These cave drawings convey early human life through pictures.

As tribes increased in number, each forming their own language and life styles,

Slide #14 competition over hunting grounds caused intertribal wars.

Slide #15 Each tribe would post look outs around their perimeter to alert the village of any would be attackers.

Slide #16 At the first sign of danger, the look out would run to warn the tribe. This system proved to be too slow, and the signal system was soon adopted. Signals came in two forms: audio and visual.

Slide #17 Lookouts imitated animal noises, shot flaming arrows into the air, beat signal drums,

Slide #18 and made smoke signals to alert the village.

The need for survival had forced man to tackle one of the communications greatest obstacles: Distance.

Slide #19 With the passing of time, man's ability to communicate with art increased. He developed standard symbols to convey certain events, and began drawing them on pieces of wood.

This way stories could be transported outside the cave.

Over the years man condensed his symbols to make them easier to form and more legible. These condensed symbols marked the birth of the alphabet.

Slide #20 In the fifteenth century, religious scribes recorded almost all the written material which was all hand lettered.

Slide #21 Only the very elite were educated to read and write, and the common people who could not afford books remained illiterate.

Slide #22 In the fifteenth century, Johan Gutenberg revolutionized the whole concept of written communications with his invention of moveable type.

Slide #23 An entire page which once took hours to letter could be printed in seconds. The scribes protested Gutenberg's invention because they, like millions to follow

Slide #24 were among the first to be automated.

Slide #25 Books fell drastically in price, and wide spread education of the public began.

Slide #26 Man's technological mind had developed from its embryonic stages, and in the years to come technology would become a way of life.

Slide #27 In the centuries following Gutenberg's invention, printing grew tremendously.

Slide #28 Moveable type remained the basis for all major printing for the next three hundred years.

Slide #29 Only the design of the press itself changed.

(Nece-a-fore - Ne-eeps)

Slide #30 In 1826 a French lithographer-inventor, Joseph Nicephore Niepce using a sheet of peweter coated with an asphalt solution, and an artists' camera obscura,

Slide #31 succeeded in making the worlds first photograph: a dim fuzzy image of his farm yard in central France.

Slide #32 Photography has since become one of the world's greatest technological advancements.

Slide #33 We use it in printing . . .

Slide #34 biology . . .

Slide #35 and medicine.

Slide #36 Photography entertains us . . .

Slide #37 tells us stories . . .

Slide #38 and it helps us remember.

Slide #39 We have even been able to make it come alive on the screen allowing us to bring the world around us into the class room.

Slide #40 (End of music)

Slide #41 In 1835 F.B. Morse took communications and electrified it with his invention of the telegraph and Morse code.

Using the Morse code, messages could now be sent over wires at the speed of light.

Electricity, and F.B. Morse started a communications technology that spread like wild fire.

Slide #42 In 1876 Alexander Graham Bell patented the telephone.

Bell felt that if Morse could send a beep over a telegraph wire, certainly he could send a voice.

Slide #43 Today the telephone company is one of the largest in the world.

Slide #44 In the last twenty-five years Bell Telephone Research Laboratories have been responsible for some of the most amazing advanced in electronics since the discovery of electricity.

Slide #45 Fancy telephones in all sizes and shapes,

a system for direct dialing long distance calls, satellite communications systems, and the transistor are just a few.

Slide #46 The new centrex system will allow up to a dozen people in different locations to talk to each other at the same time.

Slide #47 The twentieth century has been mans greatest age, and perhaps the two greatest advancements in communications were the invention of the radio, and television.

Marconi mastered the theory of sending a message in the form of electro-magnetic waves through the air.

Slide #48 The wireless allowed man to communicate over great distances without any connecting wires.

It wasn't long before the crystal radio was replaced by a vaccum tube model.

Speakers were modified.

Sound became clearer and anntenna systems were improved to increase the distance between transmitter and receiver.

Slide #49 Man's efforts to conquer space prompted an area of electronics which has helped make communications systems easier to use, and more reliable.

Miniaturization of electronic components had to be achieved to reduce space craft weight.

Slide #50 The integrated circuit at the right is capable of doing the job of a dozen vaccum tubes shown at the left.

Slide #51 The transistor stereo radio has become an item of luxury, and its sound has reached concert hall quality.

Slide #52 (Music)

Slide #53 (Music)

Slide #54 Fire! is one of man's oldest enemies, but without it he might never have survived. Once man looses control of fire, his life and possessions are in grave danger.

Slide #55 With the use of modern communications,

Slide #56 fires can be detected and extinguished faster than ever before.

Slide #57 Fire alarms can be hooked directly to the station.

Slide #58 Within minutes after the alarm,

Slide #59 firemen and police are on route to the scene.

Slide #60

Slide #61 Police sirens

Slide #62 music build

Slide #63
Slide #64
Slide #65
Slide #66
Slide #67
Slide #68

Slides change during music
2 seconds per slide

Slide #69 Music ends.

Slide #70 It has been said that today's children have been raised by television. They are a product of the tube.

Slide #71 Television has become the most influential form of communication, particularly in the United States where the average home has any where from one to three televisions in it.

Slide #72 Since its advent early in the nineteen thirties, television has grown tremendously.

Slide #73 In the fifties color was added, and today in the seventies televisions are being made with five foot diagonal screens.

Slide #74 Much debate has been raised as to the quality of the programming now offered to the public. One thing is certain, there is a great room for improvement.

Slide #75 Modern computers, and satelite communications systems will provide the tools for students of future communications networks.

Slide #76 The possibilities are limitless,

Slide #77 and the challenge

Slide #78 is yours.

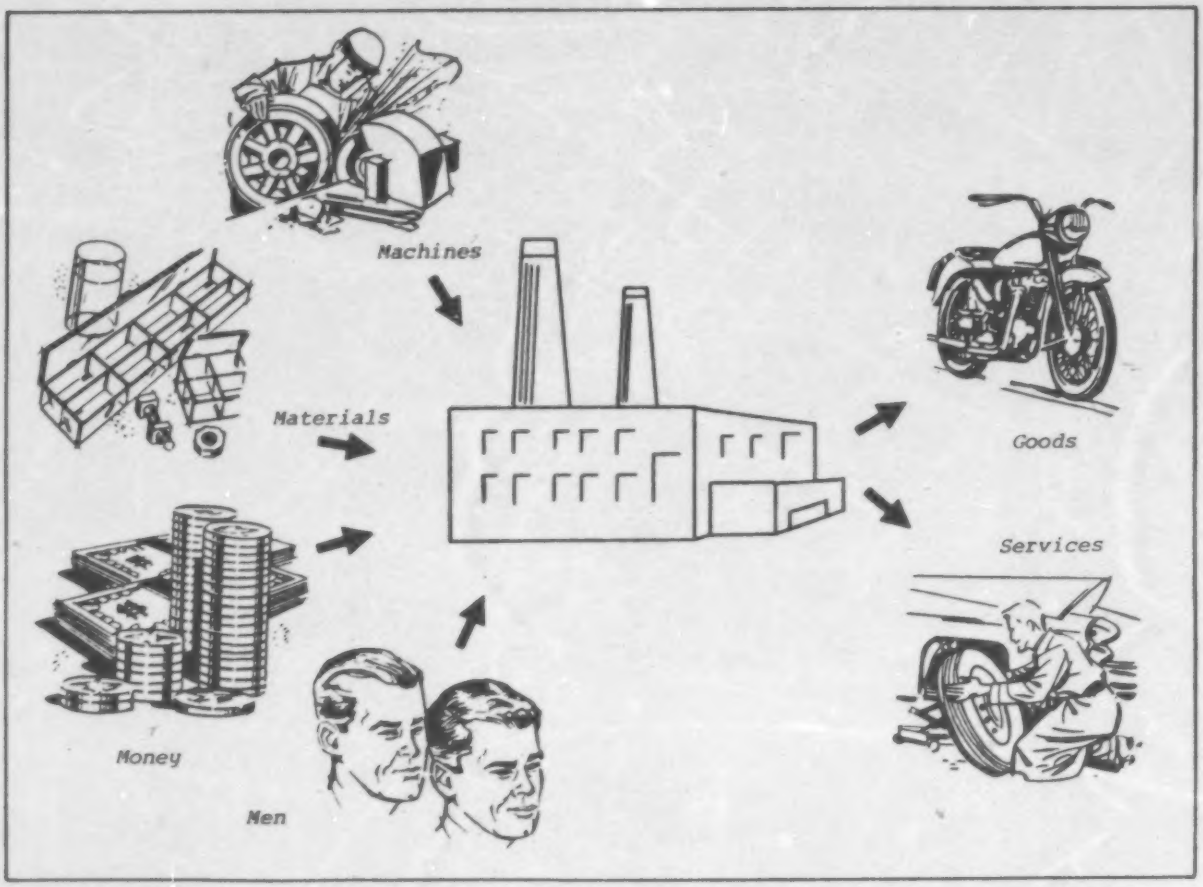
Slide #79 The End

Slide #80 Credit slide

Slide #81 Credit slide

METALS INDUSTRIES

JUL 25 1975



Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

A Proposed Curriculum

Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Metals Industries

Junior-Middle High School

Produced by

The Industrial Education Instructional
Materials Development Project
University of Wisconsin-Stout
Menomonie, Wisconsin

Project Director:

Lawrence S. Wright, Ed.D.

Assistant Director:

M. James Bensen, Ed.D.

Project Coordinator:

John M. Ritz, M.S.

Contributor to this Package:

Gerald Finch

Supported by:

The Wisconsin Department of Public Instruction;
The Graduate College and the Center for Vocational,
Technical and Adult Education, both of the
University of Wisconsin-Stout

Course Description

Metals Industries is intended to give junior high students a comprehensive overview of the materials, processes, structure and social implications of metal-oriented industries.

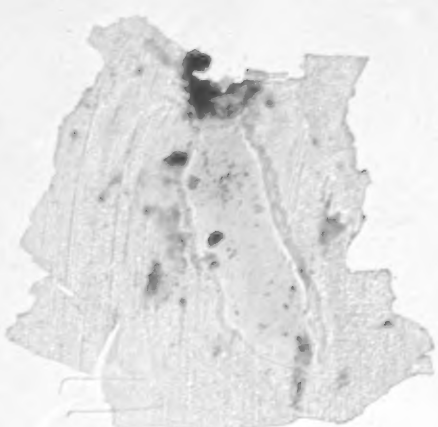
Experiences will include laboratory work with testing and processing metals; field trips; small group investigation and reports; and a class enterprise project involving the design, production and marketing of a saleable metal product.

A significant feature of this course will be field trips to local industries. The same industries will be visited several times but with a different facet of the industry emphasized at each trip, in order to allow the students to become familiar with industry from several points of view.

Opportunities for individual study will be provided.

The class will meet seven hours per week for one semester.

There are no pre-requisites.



Program Level Information

Rationale: The program level rationale was taken from: A Guide to Local Curriculum Improvement in Industrial Education, K-12, Wisconsin Department of Public Instruction.

Mission Statement: The program level mission statement is from a rural Wisconsin community.

Structure: The content structure was taken from the AVA Industrial Arts Bulletin - 1968

Scope and Sequence: The scope and sequence model is entitled: JUNIOR-SENIOR HIGH SCHOOL INDUSTRIAL EDUCATION PROGRAM MODEL.

Objectives: The program level objectives were taken from: The Wisconsin Guide to Local Curriculum Improvement in Industrial Education, K-12. They are:

1. To provide students the opportunity to work with elements of industry to gain understanding of how they function in producing goods and services.
2. To provide students with the opportunity to understand the interdependence of society and industry.
3. To provide students the opportunity to explore the context in which industry has developed and continues to develop.
4. To provide students the opportunity to explore industrial occupational areas as a basis for selecting a career and understanding the pursuits of others.
5. To provide students the opportunity to prepare specifically for entry into appropriate industrially related occupations and develop a base for further occupational education.

Statement of Population Characteristics

The students for whom this course is intended are assumed to be normal junior high boys and girls, from a predominately rural area, with needs and interests common to their age group. They are assumed to be mainly middle-class socially and economically, with a generally favorable attitude toward industry and its role in society. They live in an area within driving distance of a major urban industrial area, and may reasonably be expected to seek employment there upon emancipation. They are assumed to have at least one-half year of previous experience in Industrial Arts, in the form of a similar required course outlining the industries using wood and plastics. There is no specific pre-requisite to Metals Industries.

Course Level Rationale

The program of which this course is a part presupposes the necessity of teaching students about industry in its entirety, rather than just trade skills or narrow subject fields. At the classroom level however, this total approach becomes unwieldy unless it is subdivided into manageable, but identifiable segments. This is necessary in order for the student to gain insight into the concepts and practices prevalent throughout industry, and yet be able to see this individual course as a concrete, homogeneous unit.

Course Level Mission Statement

Name of the Course: Metal Industries

Orientation and Location: This course will be a part of the industrial education program for a Wisconsin area school. It will be a required one semester course.

Who is to be Prepared: Junior high boys and girls.

To do What?: As a result of this course, the student will be able to:

1. Recognize, analyze and justify the use of the metals used in consumer products with which he will come into contact.
2. Perform simple tests to determine the important properties of various metals.
3. Rate metal industries in their relative importance to the other segments of American industries.
4. Analyze and explain several positive and negative aspects of metals industries as evidenced in our society.
5. Identify and explain the several most important metal-working processes.
6. Perform simple processing operations related to metals industries.
7. Specify those functions of metals industries that are common to all industries, and demonstrate his understanding through practice.
8. Formulate effective career possibility selections at different levels of metals industries.

To What Level of Qualification: Consistent with the standards of evaluation developed herein for the specific objectives stated above.

Scope and Sequence

Length of Course - 18 weeks (126 hours)

Introduction to Course, and administrative activity		3 hours
Unit 1:	The Physical Characteristics and Uses of Metals	3 weeks (21 hours)
Unit 2:	Social Implications of Metals Industries in our Society	2 weeks (14 hours)
Unit 3:	Metalworking Processes	4 weeks (28 hours)
Unit 4:	Organizational Functions of Metal Industries	8 1/2 weeks (60 hours)

Field trips will be made outside of the 126 hours of class time and are not shown as a part of this Scope and Sequence.

Unit 1

The Physical Characteristics and Uses of Metals

Introduction: In order to more fully grasp the significance and implications of metal industries in our society the student must first gain some familarity with the metals themselves. This unit is designed to acquaint the student with the physical and chemical properties of metals and the effects of these properties upon the uses to which the metals may be put in consumer products.

Objectives: The student will be able to recognize, analyze and justify the use of the metals used in consumer products with which he will come into contact.

Given samples of the following common metals (*) the student will be able to identify them with 100 percent accuracy. Common metals (*): copper, aluminum, stainless steel, cast iron, galvanized steel, and lead.

Following lecture and examination of samples the student will be able to compare and categorize the common metals (*) according to their obvious physical and visual characteristics.

After reading the textbook and scrutinizing common metal products the student will be able to recognize the various types of surface finishes used on the common metals, with 80 percent accuracy.

Given a list of the common metals (*) the student will be able to explain the following characteristic of each metal in relation to the others. Characteristics: hardness, color, ductility, corrosion resistance, tensile strength, melting point, magnetism.

The student will be able to define these characteristics of metals with 100 percent accuracy. Characteristics: (#) hardness, color, ductility, corrosion resistance, tensile strength, melting point, magnetism.

For each characteristic (#), the student will be able to, given the textbook and actual metal samples, position the samples in a prescribed order according to each metal's exhibition of that characteristic.

Following lectures on identification of and properties of the common metals (*) the student will be able to suggest three typical uses for each metal and justify the reason for its choice.

The student will participate in the compilation of data showing the most typical uses of the common metals.

The student will analyze data on the typical uses of metals to discover the relationship between metal characteristics and their application in products.

Learning Activities:

Reading textbook

Taking notes on lecture

Examining metal samples

Asking and answering questions

Group activity: compilation and analysis of data on metal usage in consumer products

View film

Teacher Activities:

Lecture on metal properties and usage and show film

Provide metal samples and describe them

Answer questions

Assist in directing small group research activity

Objectives: The student will be able to perform simple tests to determine the important properties of various metals.

The student will recognize and comply with all safety procedures while working in the testing laboratory.

The student will be able to explain the five simple tests (*) that can be performed in this laboratory, to the satisfaction of the instructor. Tests: hardness, scratch or spark test, tensile, acid, and magnetic.

The student will be able to list and describe the various metal tests that can be performed in a laboratory.

The student will be able to perform each of the five tests (*) on metals following all correct procedures using the instructional package provided.

The student will be able to trace the procedure necessary to perform a valid test.

Learning Activities:

Take notes on lecture and demonstration

Observe demonstration of metal testing equipment

Read procedure sheets for metal testing equipment

Examine testing stations

Test metal samples in lab

Teacher Activities:

Lecture on testing of metals

Demonstrate metal testing equipment

Distribute safety information

Observe student activity and answer questions

Prepare procedural information for lab activity

Resources:

Textbooks: Feirer, John L., and Lindbeck, John R., Metalwork, Second Ed., Chas. A. Bennett Co., Inc., Peoria, Ill., 1970, Unit 1 and Unit 5

Walker, John R., Modern Metalworking, Goodheart-Willcox Co., Inc., South Holland Illinois, 1970, Unit 1

Movie: "Metals and Non-Metals" 16 min., Coronet Films, Chicago

Metal samples

Magazines, periodicals and everyday consumer products

Procedure sheets for metal testing station

Comparison chart of the common metals

Laboratory and machines for metal testing

Evaluation:

The student will be evaluated in relation to the objectives on three levels:

Those objectives requiring a specific level of cognitive performance will be evaluated according to a point system.

Those objectives requiring individual class participation, group participation and attitudinal performance will be evaluated as unsatisfactory, satisfactory or outstanding.

Those objectives requiring a level of psychomotor ability will be evaluated as satisfactory, unsatisfactory or outstanding.

All evaluation will be based upon a mastery level system. The student will be allowed unlimited opportunity to attain mastery level in all areas, limited only by the duration of the course.

Unit 2

Social Implications of Metals Industries in Our Society

Introduction: One of the main purposes of this course is to acquaint the student with the full scope of metals-oriented industry in the United States. This is necessary to understand the cumulative effect of metals upon the direction and quality of our society. This unit is designed to expose the student to information and sources of information that will allow him to make his own judgement regarding the value and social implications in our society.

Objectives: The student will be able to rate metal industries in their relative importance to the other segments of American industries.

The student will be able to identify the various metals industries.

The student will be able to identify the important non-metal industries in the United States.

The student will outline the following facts about metal and non-metal industries in the U.S., such as, number of workers employed in each industry, value of the product produced, geographic location.

The student will illustrate by example the importance of metal as employed in non-metal industries.

The student will, by examining typical consumer products, generalize as to the importance of metal in their manufacture.

Learning Activities:

Take notes on lecture

Read textbook

Read trade periodicals

Observe movie

Participate in small group research activity

Examine typical consumer products

Participate in field trip to local industries

Teacher Activities:

Lecture about metal and non-metal industries

Assign text material

Provide magazines and periodicals

Show movie

Set up small groups and monitor activity

Set up field trip and monitor resulting discussion

Answer questions

Objectives: The student will be able to analyze and explain several positive and negative aspects of metals industries as evidenced in our society.

The student will be able to, given a list of typical metal industry processes (*), categorize each as to its effect on the environment. Typical processes (*): mining, smelting, refining, founding, forging, and manufacture of final products.

The student will define terms relating to the typical metal processes (*).

The student will participate in the construction of a display project illustrating environmental effects of a segment of the metals industry.

Learning Activities:

Read textbook

Read trade periodicals and magazines

View movie

Take notes on lecture

Read periodicals of conservation and ecology groups

Participate in field trip to local industry

Work through instructional package on constructing classroom displays

Teacher Activities:

Give lecture regarding positive and negative effects of metal

Show movie

Assign textbook materials

Provide periodicals and magazines

Provide instructional package on displays

Set up field trip and direct resulting discussion

Resources:

Textbook: Feirer and Lindbeck, Metalwork, 2nd Ed., Unit 42

Movies: "America Becomes an Industrial Nation," 25 min., McGraw-Hill Text Films, New York

"Metals and Ores," 10 min., Douglass Productions, Sedona, Ariz.

Trade magazines and periodicals

Conservation and ecology periodicals

Local industry

Paper, wood and simple tools for construction classroom displays

Evaluation:

The student will be evaluated in relation to the objectives on three levels.

Those objectives requiring a specific level of cognitive performance will be evaluated according to a point system.

Those objectives requiring individual class participation, group participation and attitudinal performance will be evaluated as unsatisfactory, satisfactory or outstanding.

Those objectives requiring a level of psychomotor ability will be evaluated as satisfactory, unsatisfactory or outstanding.

All evaluation will be based upon a mastery level system. The student will be allowed unlimited opportunity to attain mastery level in all areas, limited only by the duration of the course.

Unit 3

Metalworking Processes

Introduction: To develop full appreciation of the nature and use of metals in consumer products the student must have first-hand experience with some of the processes involved in metalworking. This unit is designed to give the student both hands-on experience using metals and metalworking tools and, in addition, provide him with information regarding the total range of industrial metalworking processes.

Objectives: The student will be able to identify and explain the several most important metalworking processes.

The student will define the following metalworking processes (*) to the satisfaction of the instructor. Metalworking processes (*): shearing, bending, forming, turning, milling, grinding, casting, welding, riveting, soldering.

Through analysis of typical products the student will be able to infer the processes or process used in its manufacture.

The student will categorize the several most important metalworking processes (*) as to the segment of metal industry in which they are used.

Learning Activities:

Read testbook

View films

Participate in field trip to local industry

Examine and analyze consumer products

Take notes on lecture

Answer and ask questions regarding metal processes

Teacher Activities:

Give lecture on metalworking processes and machines

Show films

Assign textbook readings

Set up field trip to local industry and supervise discussion

Assist in student's analysis of consumer products

Answer questions regarding metal processes

Objectives: The student will be able to perform simple processing operations related to metals industries.

The student will recognize and comply with all metal shop safety rules as outlined by the instructor.

The student will demonstrate to the instructor the ability to use the following hand tools (*) using only the recommended procedures: Hand tools (*): files, hammers, wrenches, screwdrivers, snips, scriber, dividers, rules, soldering coppers, drills, vices, rivet set, combination set, common foundry tools, taps and dies.

Presented with any of the common metalworking hand tools (*) the student will identify and explain the use of each tool with 80 percent accuracy.

The student will demonstrate to the instructor's satisfaction the ability to use the following metalworking machines (#): bar folder, box and pan brake, drill press, band saw, bench grinder, metal lathe.

The student will demonstrate the ability to interpret written plans and specifications with 100 percent accuracy.

Given a sample of sheet metal and specifications for a simple sheet metal pan, the student will be able to complete the pan using proper materials, tools and procedures.

Given plans and specifications the student will, following proper procedures, melt and pour hot type metal into a simple mold to produce a product.

Given plans and specifications and following proper procedures the student will be able to produce a useable object using the metal lathe.

Given specifications the student will follow proper procedures in using the grinding wheel to sharpen a knife or other edged tool.

The student will follow proper procedure in using rivets and solder to fasten together metal objects.

Learning Activities:

Observe demonstrations of hand tools and machines

Work through instructional packages for each metalworking machine

Practice with metalworking hand tools

View movies

Discussions and questions regarding plans and specifications

Read textbook materials assigned

Do assigned metalworking projects

Teacher Activities:

Demonstrate tools and machines

Prepare and distribute instructional packages for metalworking machines

Show movies

Monitor discussion of plans and specifications

Assign textbook readings

Demonstrate procedures for metalworking projects

Distribute procedure sheets for metalworking projects

Answer questions

Resources:

Textbooks: Feirer and Lindbeck, Metalwork, 2nd Ed., Units 3-30, 35-6; Walker, Modern Metalworking, Units 3-47

Movies: "It's Easy to Bend," 17 min., Di-Acro Division of Houdaill Industries, Inc.

"Metal Shop Safety," 16 min., McGraw-Hill Text films, New York

"Metalwork Hand Tool Series," 16 min. each, & "Metalworking Machines," series, 16 min. each, (9 films), Moreland-Latchford Productions, Toronto

"Drama of Steel," 34 min., U.S. Dept. of Interior

"Drama of Metalforming," 28 min., Shell Oil Co., New York

"The Care and Use of Hand Tools," 11 min., U.S. Navy Dept.

Instructional packages

Procedure sheets for projects

Local industries

Consumer products

Evaluation:

The student will be evaluated in relation to the objectives on three levels.

Those objectives requiring a specific level of cognitive performance will be evaluated according to a point system.

Those objectives requiring individual class participation, group participation and attitudinal performance will be evaluated as unsatisfactory, satisfactory or outstanding.

Those objectives requiring a level of psychomotor ability will be evaluated as satisfactory, unsatisfactory or outstanding.

All evaluation will be based upon a mastery level system. The student will be allowed unlimited opportunity to attain mastery level in all areas, limited only by the duration of the course.

Unit 4

Organizational Functions of Metal Industries

Introduction: In the study of metals industry it is essential that the student become familiar with the organizational structure. In order to comprehend the organizational function of industry, their individual operations and their inter-relationships, the student needs some first-hand experience. This unit is designed to give students both an opportunity to observe actual operations of industrial organization and the simulation of industry through a class enterprise. Since the depth of importance of each function of industry is indicated by the number and types of occupations which each entails, the student in this unit is given an opportunity for investigation of occupations and careers available in the metals industry.

Objectives: The student will be able to specify those functions of metals industries that are common to all industries, and demonstrate his understanding through practice.

The student will be able to identify the major functions of industry to the satisfaction of the instructor.

The student will diagram the organization of a typical industry.

The student will participate in a class organized enterprise to produce a saleable product.

The student will appraise product ideas to determine a suitable product for enterprise production.

The student will participate in the organization of a class enterprise company.

The student will volunteer to participate in at least two levels of industrial functions in the class enterprise company.

The student will assist in the planning and operation of all the class enterprise activities.

Learning Activities:

Take notes on lecture about organization of industry

Read text materials

Read resource materials assigned

Use charts and tables showing industrial organization

Participate in field trip

Participate in small group activity relating to organization of class enterprise

Assist in the following activities relating to the class enterprise: form company; elect officers; set up financial system including corporate stock, capitalization and payroll; select product to be produced; designate personnel for the various organization functions; order materials; identify processes; plan production layout; schedule production; market final product; liquidate company.

View movies

Teacher Activities:

Lecture on organization of industry

Assign text materials

Provide resource materials on industrial organization

Provide charts and tables showing industrial organization

Set up field trip and monitor small group activity resulting

Direct the formation of class enterprise company

Show movies

Assist in operation of class enterprise

Act as resource person and answer questions

Objectives: The student will be able to formulate effective career possibility selections at different levels of metals industries.

Given a list of the major functions of industry the student will identify and list at least five job possibilities at each level of function in the metals industry.

Given a list of typical employment opportunities in the metals industry the student will be able to use the Dictionary of Occupational Titles or the Occupational Outlook Handbook to determine all the requirements needed for employment in each occupation.

The student will read trade journals and periodicals to discover expected future trends in metals industries occupations.

Learning Activities:

Read textbook materials and trade journals

Use Dictionary of Occupational Titles and Occupational Outlook Handbook

Complete assignment sheet relating to occupations

Participate in class discussion of career possibilities in the metals area

Teacher Activities:

Assign text materials

Provide and demonstrate the use of Dictionary of Occupational Titles and Occupational Outlook Handbook

Provide trade journals and periodicals

Direct class discussion relating to occupations in metals

Answer questions

Resources:

Textbooks: Feirer and Lindbeck, Metalwork, 2nd Ed., Units 6, 41-43; Walker, Modern Metalworking, Units 49, 50

Movies: "The Anatomy of Free Enterprise," 20 min., Modern Learning Aids, San Francisco

Teacher developed resource materials on industrial organization

Trade journals and periodicals

Local industry

Dictionary of Occupational Titles and Occupational Outlook Handbook

Metals lab area for enterprise production

Evaluation:

The student will be evaluated in relation to the objectives on three levels.

Those objectives requiring a specific level of cognitive performance will be evaluated according to a point system.

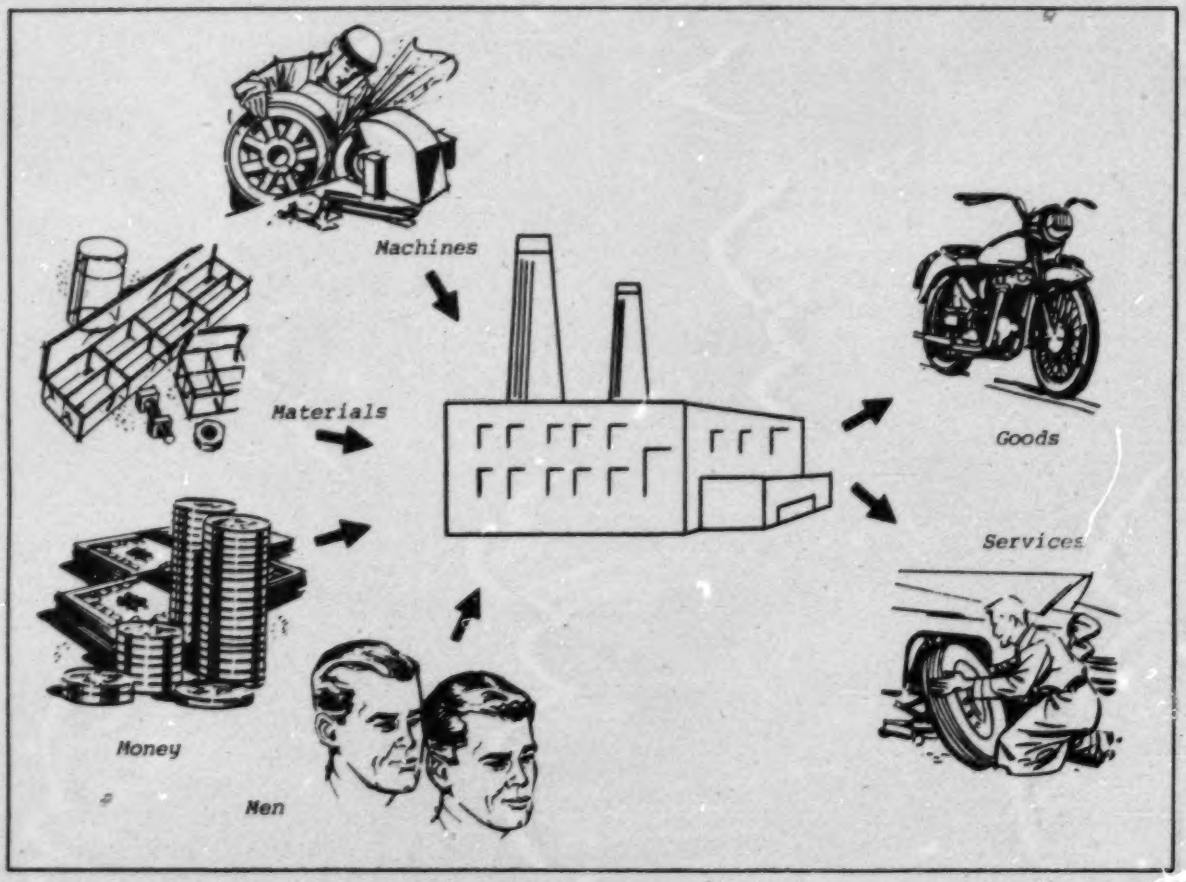
Those objectives requiring individual class participation, group participation and attitudinal performance will be evaluated as unsatisfactory, satisfactory or outstanding.

Those objectives requiring a level of psychomotor ability will be evaluated as satisfactory, unsatisfactory or outstanding.

All evaluation will be based upon a mastery level system. The student will be allowed unlimited opportunity to attain mastery level in all areas, limited only by the duration of the course.

POWER AND ENERGY

JUL 25 1975



Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Learning Activity Package

Prepared as an Aid in Implementing
The Wisconsin Guide to Local Curriculum
Improvement in Industrial Education, K-12

Introduction to Power and Energy

Middle-Junior High School

Pertaining to Field Objective Number One

"To work with the elements of power
and energy to gain an understanding of
how they function in producing goods and services."

Produced by

The Industrial Education Instructional
Materials Development Project
University of Wisconsin-Stout
Menomonie, Wisconsin

Project Director:

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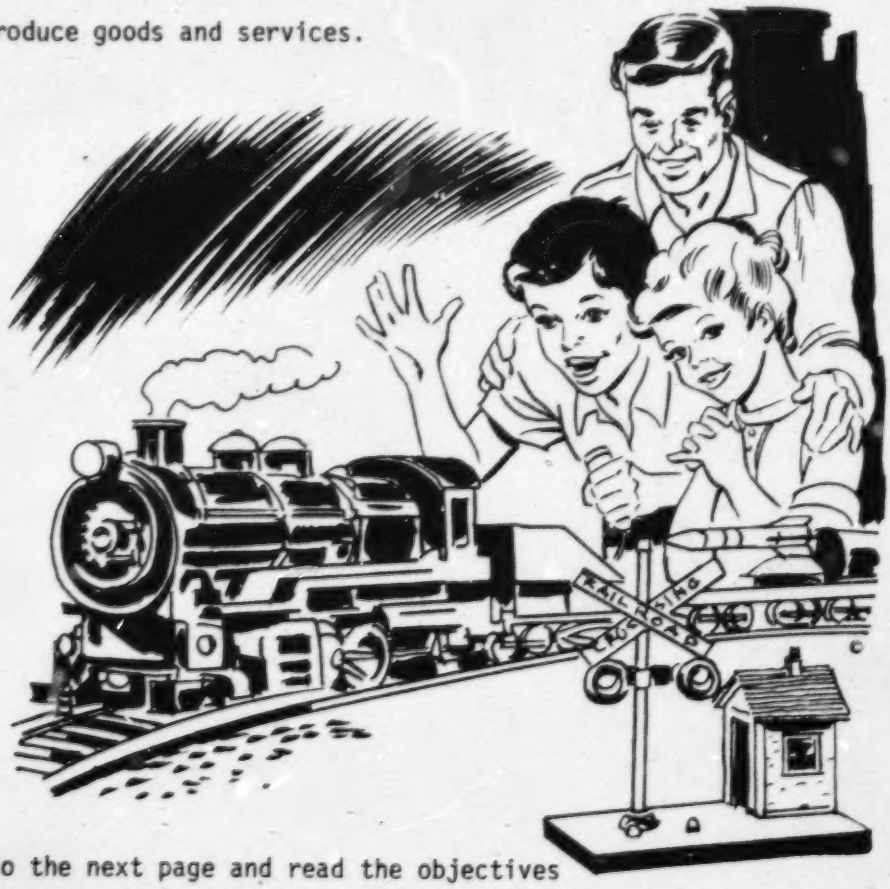
RATIONALE:

From the beginning of time, the basic elements of power have been available to man. During the early centuries of civilization, man used mostly wind, water, and muscle as his primary source of power. It has only been in the last 250 years that man has developed the technical knowledge and skills needed to construct alternate forms of power using the natural elements available to him. In the last 30 years, man has discovered the theory of the atom and has developed ways to harness its energy, thus providing a new source of power.

By completing the objectives and activities in this package, you will develop a basic understanding of power and the many ways in which it is used to produce goods and services.



Please turn to the next page and read the objectives carefully!!

OBJECTIVES

Terminal Objective:

You will have an understanding of power and how it aids in producing goods and services.

Enabling Objectives:

1. You will formulate an understanding of the terms power and energy, and be able to distinguish between them.

2. You will, at the completion of this package, be able to identify three different sources of energy and give examples of each.

3. You will know the five different kinds of energy and point out three of the five that are used in your lab.

4. You will, when given a problem dealing with power, develop an acceptable solution (or at least one that you think will work) to solve the problem and test your solution by constructing a working prototype of the solution and problem.

5. Given an item to be produced, you will determine the necessary sources and kinds of power needed to produce that item.

6. Given a list of ten items, you will match the given item to the corresponding kind of power needed to make that item function properly.

7. Given any item you will describe the kinds of power needed to make that item function properly.

Options: Read the self-test on the following pages and then check the following selections that apply to you.

___ If you feel you can meet the above objectives:

___ A. See the instructor for a teacher evaluation

___ B. Take the self-test as a self evaluating device, then see your instructor.

___ If you feel you cannot meet the above objectives:

___ A. Take the self-test to see what objectives your studying should be based upon, then turn to the media section on page 4.

___ B. Skip the self-test and turn to the media section on page 4 to help you achieve the objectives.

Self-Test: Answer the following questions. You may write in this booklet.

1. What does the term energy mean?

2. Define the term power?

3. What is the definition of the term "power and energy?"

4. List and explain the three supply sources of energy.

5. List and explain the five different kinds of energy. List two examples of each.

MEDIA SECTION

Objective Number 1: You will formulate an understanding of the terms power and energy, and be able to distinguish between them.

Optional Media: Choose one or more.

___ 1. Read pages 5 to 7 of this package.

___ 2. Read The Story of Power by General Motors, pages 2 to 3.

___ 3. Any up-to-date science book will provide some of the basic information.

Optional Activities: Choose one or more of the following activities included in this package.

Activities: Power and Energy - I-1A or 1B

Objective Number 2: You will, at the completion of this package, be able to identify three different sources of energy and give examples of each.

Media: Read pages 7 to 8 of this package.

Activity: Complete activity: Power and Energy - I-2A

Objective Number 3: You will know the five different kinds of energy and point out three of the five used in your lab.

Optional Media: Choose one or more.

___ 1. Read pages 8 to 10 of this package.

___ 2. Read a modern science book. Look in the index under energy.

Optional Activities: Choose one or more of the following activities:

Activities: Power and Energy - I-3A or 3B

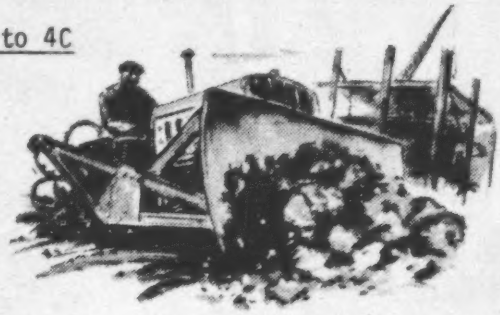
Objective Numbers 4 - 7: Read the media listed in the above references. Then complete one activity from each of the following groups.

___ Activity: Power and Energy - I-4A to 4C

___ Activity: Power and Energy - I-5A

___ Activity: Power and Energy - I-6A

___ Activity: Power and Energy - I-7A



INFORMATION SECTION

To produce goods and services industry needs still another fundamental element. This lesson will cover that element, power and energy.

Without it industry and even ourselves would not be capable of performing work. If we have little energy in our bodies, it is very exhausting to go for a long walk. How about if you had to load a huge truck? Do you think you could do it if you didn't have any energy? How would you heat your home if there wasn't any fuel to burn? Could you go on a trip with your car if there was no gas in the tank? None of these things could be done without power and energy.

Power and energy are resources valued by industry and society. They are vital if industry is to produce the goods and services needed by our society. We may define power and energy as the fundamental part in all mechanical and technological development which may be changed into work. This would be like you eating a chocolate bar when you were hiking for quick energy. Your body converts the sugar into energy and prevents you from tiring quickly.

A battery for a flashlight also converts chemical substances into energy to do work. The flashlight does not work until you turn the switch on. When you do this, you are completing an electrical circuit and electrons flow from the chemicals in the battery to the light and cause it to go on. You use the light to see and the flashlight is working. This is another example of the use of power and

energy to aid man by performing a useful service.

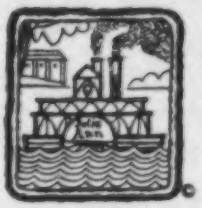
Though power and energy is the fundamental ingredient in all mechanical and technological developments which perform work for man, the phrase may be defined in separate terms.

Energy is an ability to do work. Nothing will happen with just energy being there. It must be transformed and converted into a physical force. Energy has the potential to help man, but something must be done with it if it is to perform a task. Dried wood is an example of energy. It has the ability to produce heat, but it will not produce heat if it is not set on fire.

The same is true about gasoline. It is an example of energy. Gasoline will not make your car move by itself. It must be mixed with air and ignited in the engine of your car and it is converted to mechanical energy.

Energy is a substance or ingredient which has the ability to do work, but will not do work unless it is acted upon to produce power. This brings us to the term power.

Power is a physical force which will produce work if it is controlled. It is energy that has been activated and controlled. When water flows down a river it is a stagnant form of energy. If we made a dam and put a water wheel next to the dam, we could produce power with the water and water wheel. Here the water wheel would be doing mechanical work as the power of the water turned the wheel. Power is a force which can be exerted by energy if it is harnessed (confined) and controlled. Can you think of other examples of power that can be released from stagnant forms of energy?



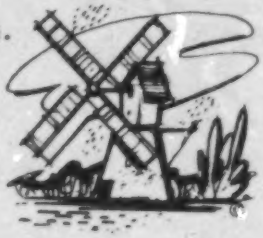
Now that you understand a little more about power and energy, let's find out something about the sources of these ingredients.

Sources of Energy

All power and energy used by our industries and society must be obtained from some source. Since we and industry are using enormous amounts of energy daily, it should be realized that many of these sources of energy will someday not be available to us.

There exist three types of sources in which all energy can be placed. These are sources where there is a continuous supply; those where the supplies are exhaustible; and those where supplies are replenishable.

Continuous Supplies. A continuous supply of energy is one that industry and society will always have available for its use. Some examples of continuous sources or supplies are wind and water. These will always be in existence. Man is starting to study how he can use the steam and hot water being forced out of the earth in different sections of our world. These are continuous supplies of energy. The United States and Iceland are conducting experiments to see if they can harness the power from this source of energy. Can you think of any other continuous source of energy? The sun is one that is being studied by scientists. It will always be producing heat and light to aid man.



Exhaustible Supplies. They are supplies of energy which will eventually run out, and man will not be able to replenish or reproduce them. A major exhaustible energy resource which has come to man's attention is oil. Oil is being used in the production of so many products, that it will run out in the not too dis-

tant future, if we do not conserve our use of it. Other exhaustible energy supplies are coal, chemicals, and uranium. When the earth was formed, only a limited amount of these materials were in its surface. Man is using many of these at an enormous rate, and nature cannot continue to supply these.

Replenishable Supplies. These are sources of materials which can be reproduced if man is conservative and plans his future. A simple example of a replenishable supply of energy is our own muscle power. If we work very hard for a long period of time, we become exhausted. We can resupply our energy if we rest and eat.

Some of our natural resources of energy can also be replenished through careful planning. The timber in our forests can be reproduced by years of growing. This wood can be burned and used as heat, though this is not a wise use of wood. Can you think of other sources of energy that are replenishable?

Kinds of Energy

Energy is an ability to be able to perform work. We have already discussed the three types of supplies of energy we have available to us. Now we are going to talk about the different kinds of energy that exist in our society. If you read different books you will find that energy is classified in many ways. Here we will break it down into five different kinds. These are natural, heat, mechanical, chemical, and atomic energy. We will explain and identify a few examples of each.

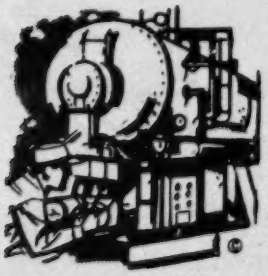
Natural Energy. This is energy which is in the state provided by nature. It is existing without any type of man-made change. Some examples of natural energy are the wind,

water, and muscle energy.

Heat Energy. The molecules of every material are in constant motion. They vibrate in place or move around in the material. As they move, they rub together and produce heat. This energy produced by molecular motion is called heat energy. Examples of heat energy are the sun, and the burning of coal, fuel oil, gas, and wood.

Chemical Energy. All materials possess chemical energy. This energy can be transformed into a useable form. It is energy produced by the bonds of two or more atoms. A common example of chemical energy is that energy produced by batteries and dry cells. Chemical energy is also used by plants for growing. Other examples of chemical energy are matches and heating from coal, gasoline, and fuel oil. These materials burn and their atoms release chemical energy. Dynamite and bullets also transfer chemical energy to produce an explosion to perform their work.

Mechanical Energy. This is energy caused by a material's motion or potential to move. When you rub your hands together you produce heat by using mechanical energy. Often mechanical energy is the result of some other form of energy starting the work. Gears, belts, pulleys, and levers are often used in relation to mechanical energy. An automobile uses many forms of mechanical energy in its operation. Hand tools and machines also use mechanical energy when they operate, although the work is generally started with natural or chemical energy. Does your bicycle use mechanical energy?



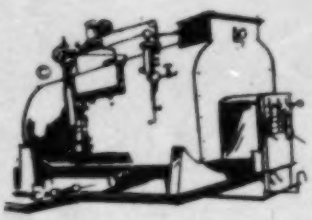
Atomic Energy. This is energy produced from within the atom. Uranium and plutonium atoms can be bombarded by neutrons in nuclear reactors and

when this happens, energy is released from within the atoms.

Reactors vary in form and the materials used in them, but basically they are a means of carrying on this chain reaction of bombarding the atoms of uranium and plutonium under conditions where the rate of reaction can be controlled. The uranium and other materials become very hot in this process and the heat can be used to produce steam for the purposes of driving turbines or engines to produce power. Examples of the use of atomic energy are nuclear reactors and submarines. Can you think of any others? Your mother may be using atomic energy in her kitchen. What would this be?

Although we have discussed five major classes of energy, many machines used by industry and society are operated by more than one kind of energy. When power is used, it generally proceeds through a conversion cycle. The automobile is an excellent example of using many kinds of energy. You use muscle energy to turn the key. The battery (chemical energy) turns the starter to start the engine (mechanical energy). When the engine starts it ignites gasoline (heat energy) which moves the pistons (mechanical energy) and enables the car to move.

This was a brief explanation of the different kinds of energy we and industry use. When you are performing any work or operating a machine, try to think of the types of energy being used and how they have helped our society progress.



Activity: Power and Energy - I-1A Name _____

Period _____

What is Power and Energy?

In this activity you will analyze the terms "power and energy." Answer the questions below and construct a definition of "power and energy" that you can understand and accept.

1. Using three different sources (such as a dictionary, book, encyclopedia, etc.) write the definition of "energy", as given in each source. Energy is:

   A.

   B.

   C.

2. Using the above definitions, write in your own words, a simple definition of "energy" that you can understand and accept.

3. Using three different sources, write the definition of "power" as stated in each source. Power is:

   A.

   B.

   C.

4. In your own words write a definition of "power" that you can understand and accept. You may use the above definitions to help you formulate your own definition.

Activity: Power and Energy - I-1A (cont.)

5. Using two different sources, write the definition of "power and energy" as stated in each. Consult the media section of this package for resources. Power and energy are:

   A.

   B.

6. Review your definitions of "power" and "energy" and the definitions stated in question 5. Now write a simple definition of "power and energy" that you can understand and accept.

Activity: Power and Energy - I-1B Name _____

Period _____

What is Power and Energy?

Directions: Using examples of power and energy (sketches, photographs, pictures, etc.) and furnished supplies, design a poster which explains the definition of power and energy.

Activity: Power and Energy - I-2A Name _____

Period _____

Sources of Energy

Directions: Using a map of the United States that has been covered with clear plastic, locate our sources of energy. Use a red marker to locate the exhaustible supplies of energy and a black marker to locate the replenishable supplies of energy. You may wish to use symbols to identify the various types of energy. Some examples are the following:

oil

electricity

forests

coal

natural gas

uranium

minerals

You may also have some other symbols you may wish to design yourself.

Activity: Power and Energy - I-3A Name _____

Period _____

Kinds of Energy

Question: List and explain the five different kinds of energy and two examples of each.

Activity: Power and Energy - I-3B Name _____

Period _____

Kinds of Energy

Question: Walk around your industrial arts laboratory. Look at the different machines and tools that are in the lab. List three kinds of energy that are used to power this equipment. List examples of equipment that are powered by these kinds of energy.

_____ energy	_____ energy	_____ energy

Activity: Power and Energy - I-4A

Name _____

Period _____

Directions: In a group of five or less, discuss the problem below and formulate an acceptable solution.

You are in a space ship with four more companions. You have drifted off course and have strayed 10 million miles from earth, your destination. You have just run out of rocket fuel, but you are still traveling at a rate of 250,000 miles per minute. The rocket is drifting toward the sun and picking up speed as the sun's gravity becomes stronger.

Problem: With only battery and muscle power remaining in the space craft, formulate a way to stop the craft or at least a way to put the ship back on course.

Activity: Power and Energy - I-4B Name _____

Period _____

Directions: Using any resources or materials available, design and build a power source that will drive a pencil sharpner at a speed of no more than 80 revolutions per minute (RPM's). Any power source may be used along with any gear, friction, or belt reduction system.

Layout the proposed solution to this problem (full size) on butcher paper or equivalent before constructing it.

Activity: Power and Energy - I-4C Name _____

Period _____

Directions: Using the sun or an artificial light source and any other materials available, construct an instrument that will use the light source and change it into a different source of power.

Design and layout this item on butcher paper before starting construction.

Activity: Power and Energy - I-5A Name _____

Period _____

Sources and Kinds of Energy Required to Make a Tic-Tac-Toe Game

Materials:

1. 1 - board, hardwood, 3" x 3" x 1" (part A)
2. 1 - tab, hardwood, 2 3/8" x 3/4" x 1/8" (part B)
3. 1 - screw, 1/2" round headed wood screw (part C)
4. 4 - 1/2" dia. black marbles
5. 4 - 1/2" dia. white marbles

Procedures and Questions:

A. Using the drawings at the end of the activity, cut the board to size

1. Question: What sources and kinds of energy were used?

B. Using the drawings, drill press, layout tools, and a 19/32" drill bit, drill the two holes in the side of the block 2 3/8" deep.

2. Question: What were the sources and kinds of energy used for this procedure?

C. Using the drawings and layout tools, lay out the lines and depressions on the top of the block.

3. Question: What sources and kinds of energy were used for this operation?

D. Make the 9 depressions in the block with a 7/16" drill bit and drill press.

4. Question: What sources and kinds of energy were used for this operation.

E. Using a hand saw cut the lines 1/16" into the top of the block.

5. Question: What kinds and sources of energy were used here?

F. Using the jig saw, cut the tab (part B) to size.

6. Question: What sources and kinds of energy were used in this operation?

G. Drill the small hole into the tab. It should be large enough so it will swivel.

H. Sand the edges of the block.

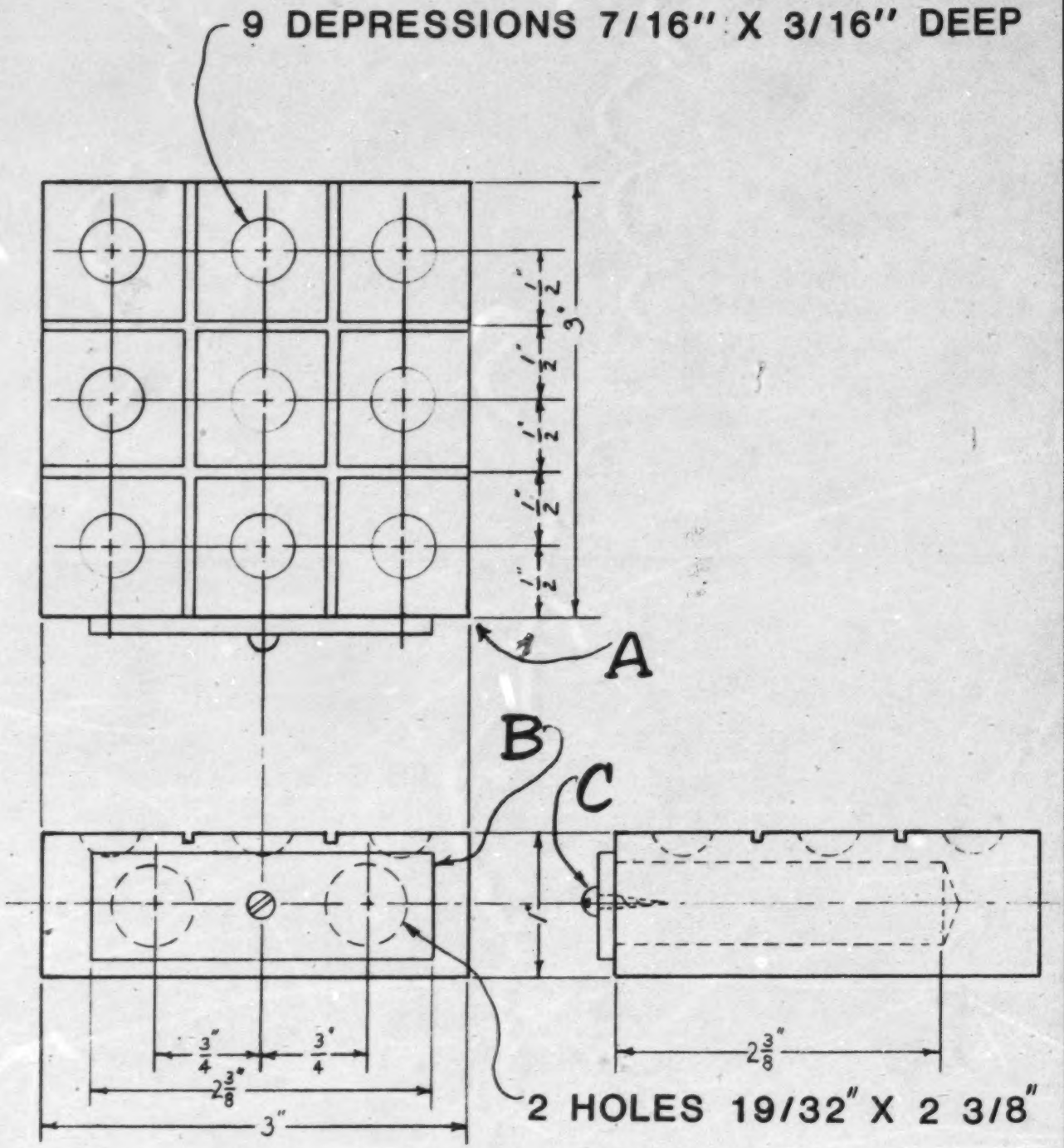
I. Attach the tab to the block with the 1/2" wood screw.

7. Question: What source and kind of energy was required?

J. Place the marbles into the holes in the side of the block. Does everything work properly?

K. Play a game of tic-tac-toe.

8. Question: What sources and kinds of energy were required?



GAME BOARD ASSEMBLY

Activity: Power and Energy - I-6A Name _____

Period _____

Directions: Place the letter from column two in front of the corresponding item in column one. Some items may require more than one answer.

Column 1	Column 2
1. _____ Car battery	A = Heat
2. _____ Tug boat	B = Mechanical
3. _____ Sail boat	C = Chemical
4. _____ Neon light	D = Atomic
5. _____ Solar battery	E = Muscle
6. _____ The USS Nautilus submarine	F = Wind
	G = Water
7. _____ Bicycle	
8. _____ A Titan Rocket	
9. _____ A flower	
10. _____ A nuclear reactor	

Activity: Power and Energy - I-7A Name _____

Period _____

Directions: Place the proper number before the work to be done to indicate the source(s) of energy and the proper letter before the work to be done to indicate the kind(s) of energy needed to produce the work.

Source	Kind	Work
_____	_____	Drilling a hole by hand
_____	_____	Drilling a hole with a drill press
_____	_____	Turning on an overhead light
_____	_____	Driving a car
_____	_____	Eating food
_____	_____	Burning wood
_____	_____	Lighting a match
_____	_____	Starting a go-cart
_____	_____	Using a micro-wave oven
_____	_____	Using a sewing machine

1. Exhaustible
2. Replenishable
3. Continuous

A. Natural
B. Heat
C. Chemical
D. Mechanical
E. Atomic

Student Evaluation

Power and Energy

Name _____

Instructor _____

School _____

Directions: Answer all of the following questions to the best of your ability. The questions are written to evaluate your knowledge and understanding of the area of industrial arts covered in this package. Choose the answer which best completes the statement.

1. Power can be defined as:

   a. An ability to do work
   b. A great thrust
   c. The rule of a police officer
   d. A physical force which will produce work if it is controlled.

2. Energy is:

   a. An ability to do work
   b. Not replenishable
   c. A physical force
   d. Power

3. Power and energy are:

   a. Valued by industry and society.
   b. The fundamental part in all mechanical and technological development which may be changed into work.
   c. Needed by industry to produce goods and services.
   d. All of the above

4. Energy supplies which will eventually run out, and will not be able to be replenished by man are called:

   a. Continuous supplies
   b. Exhaustible supplies
   c. Replenishable supplies

5. Wind, water, and the sun are examples of what types of supplies of energy.

   a. Continuous supplies
   b. Exhaustible supplies
   c. Replenishable supplies

6. Energy which is in its natural state and exists without any type of man-made change such as wind, water, and muscles are referred to as what kinds of energy?

a. Atomic
b. Heat
c. Mechanical
d. Natural

7. Energy produced from within atoms is called

a. Atomic energy
b. Heat energy
c. Chemical energy
d. Mechanical energy

8. When the molecules of a material are in constant motion and rubbing together, they produce what kind of energy?

a. Natural energy
b. Heat energy
c. Chemical energy
d. Atomic energy

9. Gears, belts, pulleys, and levers are often associated with what kind of energy?

a. Natural energy
b. Chemical energy
c. Mechanical energy
d. Atomic energy

10. An automobile uses what form(s) of energy in its operation?

a. Natural energy
b. Heat energy
c. Chemical energy
d. Mechanical energy
e. All of the above